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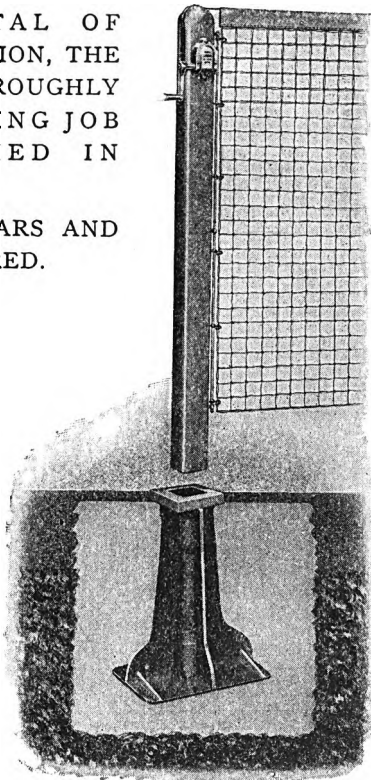
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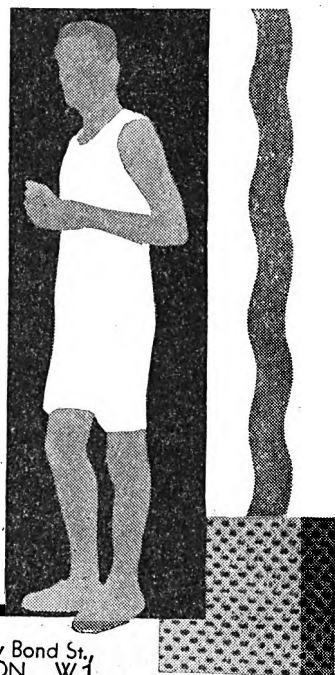
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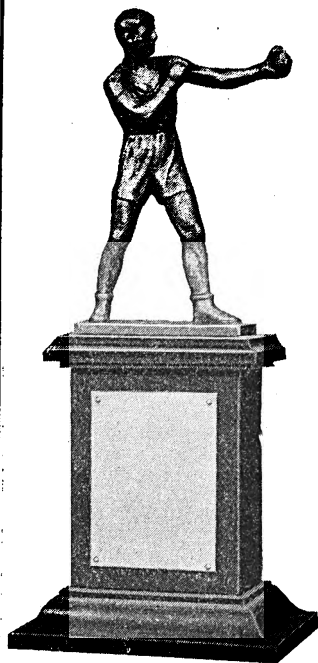
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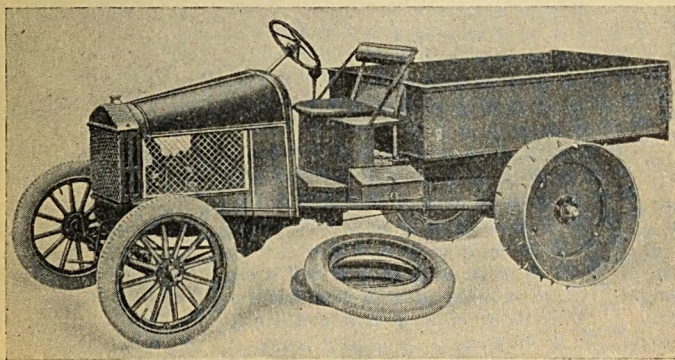
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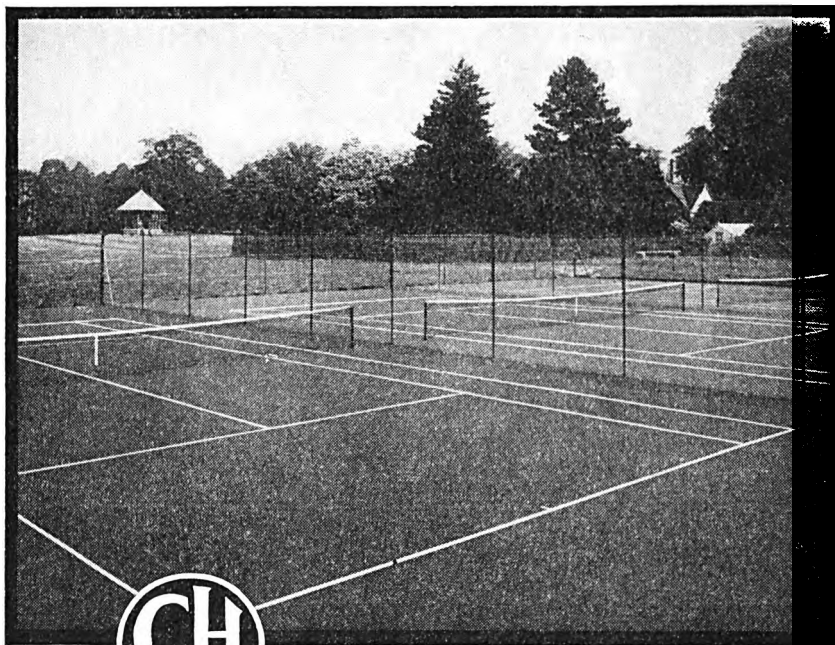
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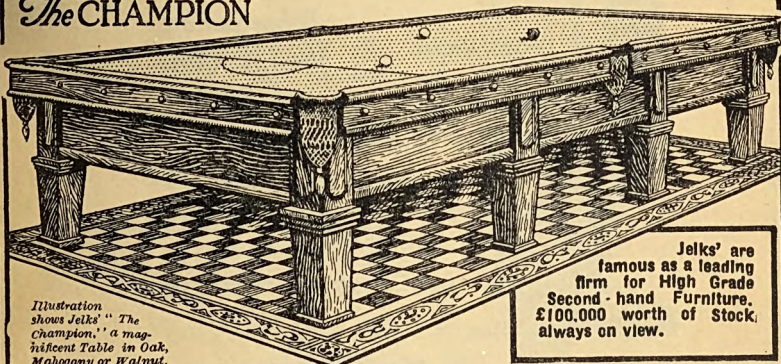


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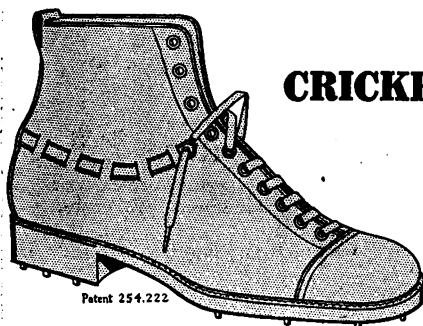
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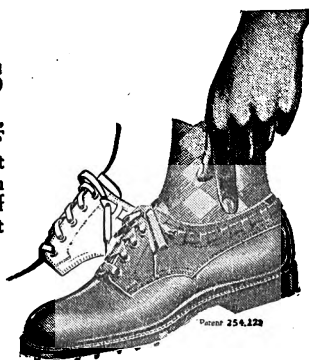
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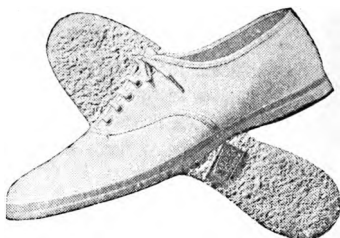
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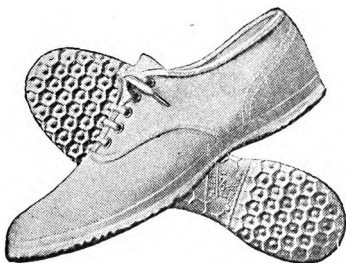
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MANUAL OF PHYSICAL TRAINING

CHAPTER I

THE OBJECTS OF PHYSICAL TRAINING

1. OBJECTS OF PHYSICAL TRAINING

1. Broadly speaking, the object and scope of physical training are to enable the man to acquit himself as a soldier. The basis of all good service is physical efficiency. An unsound man may do his best, but this must fall short of the physical capability of a sound man who inevitably can do better.

The nature and variety of a soldier's life preclude any but fit men engaging in it without encumbering the hospitals.

The mental strain endured by the soldier in the last war is not likely to be less in the next. It will inevitably be greater. It is therefore vitally necessary that the soldier should be so fit as to be able to make the best return for his training in all the weapons of war under the worst conceivable conditions of mental and physical strain.

The formation of character and the development of leadership are of vital importance to the soldier because without a measure of both he is unable to pull his full weight in the training and fighting machine in peace or war, and he is handicapped in his efforts to become successfully and (for him) satisfactorily re-absorbed into civil life at the termination of his service.

2. The object of physical training, therefore, is to :
 - i. Develop character.
 - ii. Produce alertness of mind.
 - iii. Create bodily fitness in harmonious proportion.
3. The recruit's course of physical training is to help him to realize what it means to be fit and to show him methods of achieving this object and of keeping himself fit thereafter.

It is not sufficient to train the muscles alone and to neglect the heart, lungs, and other internal organs, for it is on the internal organs that the body depends not only for its health but for its very existence.

The required condition of physical fitness necessitates that the heart and lungs should be above all things be sound and healthy; but the harmonious development of the *whole*—the skeleton or framework, the internal organs (including the brain and nerves) and the muscular system—is necessary to produce this condition.

The ordinary daily work of the individual develops some parts of the body and neglects others. If the brain alone is worked the body suffers, and *vice versa*. Manual labour is often "one-sided," the positions adopted are apt to be cramped and crooked, certain muscles are employed very much more than others and the range of movement is frequently very limited. The result of this is inharmonious development.

The exercises employed in a system of physical training, if they ensure as they should the harmonious development of the whole body, will at the same time correct the faults engendered by one-sided work and so put the body in a better state to perform any other work that may be required of it.

4. The above remarks indicate the primary objects that should be kept in view in the training of the *man*, whether soldier or civilian. But as regards the special training of the *soldier* in order to fit him for his life as such, apart from the technical training of the branch of the service to which he belongs, the following requirements should be kept in view, viz.:—a soldier should be well disciplined, a good marcher, intelligent, smart, active and quick, able to surmount obstacles in the field and capable of withstanding all the strains and hardships of active service.
5. At the same time as he develops his body he must be taught to realize that he himself achieves this by his own effort, and is merely guided by his instructor.

Interest in the possibility of his own power and the capacity to produce that power beget self-effort. Self-effort can therefore be produced.

When that has been done, it then becomes vitally important that self-effort shall be guided into the proper channel of team spirit.

The recruit's voluntary enlistment for military service is ostensibly an expression of team spirit, and his own bodily fitness is the essential factor which enables him to maintain that spirit.

The fostering of *esprit-de-corps* and the development of reverence for his body in order that he may give service compatible with the traditions of those who have preceded him are correlated and must accompany all sound physical training instruction.

6. The recruit on joining is not in a fit state to undertake his work as a soldier without preparation, and the performance of purely military exercises, drill, route marching, rifle exercises, stable duties, riding, gun drill, etc., are not sufficient, however gradually they may be taken, to put him into the required state of physical fitness. Neither is it possible by means of these military exercises alone to correct the bad habits too often acquired before enlistment.

The joy of experiencing a high state of physical fitness never perfectly realized before enlistment and now harnessed by his instructors to *esprit-de-corps*, establishes a state of mind that produces a man who will never feel that he could fall out on the line of march or go sick without sufficient cause.

7. The soldier's training is completed regimentally, but in order to prepare the man for and to assist this training and with a view to attaining the requirements referred to above, the recruit is given a special course of physical training which should be conducted on the principles indicated in this manual.

Continuity is preserved when he joins his regiment, to discover that his own state of mind is also the fashion there. Thus a normal state of self-confidence is created, based upon physical efficiency, so that a high state of individual morale is established, which can be rapidly moulded and strengthened by the various leaders in the unit, as military training proceeds.

8. It must be borne in mind that the performance of the various exercises is only a means to an end and that the training is not merely for the sake of the exercises themselves but for the ultimate effects of those exercises.

The mental alertness and responsiveness produced by an uninterrupted physical training course are a great asset to him and render his further education and instruction in other forms of training a far less difficult task.

The increased demand for training the individual necessitates the full training of each man.

The influence among his comrades of a physically inefficient soldier would be a source of weakness that easily might prove contagious.

Physical training must, therefore, be allowed to take its normal course. The weak man is strengthened and developed by it, and the strong man is given greater capacity for work.

A further reason for not curtailing the normal physical training course of any individual is the necessity for the full moral and mental development which are both the results of bodily action coupled with proper instruction.

9. The value of active games and sports as adjuncts to physical training cannot be over-estimated. Games and physical training should be looked upon as complementary to one another, and a man's physical education can hardly be considered as quite complete without the introduction of some form of active recreation.

But, however much they are encouraged, games cannot altogether take the place of physical training. They have not the same corrective effect, many of them are "one-sided," the same regular systematic and progressive results cannot be obtained from them, and apart from the difficulty of obtaining sufficient space for all to play, the greatest drawback to the use of games *alone* is that the weaker and less expert performer (i.e. the very man who most requires training) is often discouraged by his want of proficiency and so ends by becoming a "looker on."

CHAPTER II

PRINCIPLES OF PHYSICAL TRAINING

2. PRINCIPLES OF INSTRUCTION

The following is a general outline of the principles on which the system of instruction contained in this manual is based :—

- i. *The exercises.*—Every exercise employed has a beneficial effect on some part of the body and furthers at least one of the objects of the training. None of the exercises is either harmful or merely ornamental, and it is the sum total of *all* the exercises employed that produces the required results. Thus there are exercises for every part of the body (legs, neck, arms, etc.), and, in addition, exercises of co-ordination (balance marching, running, jumping, etc.), to ensure the harmonious working of the whole.
- ii. *The daily lesson.*—In every lesson exercises are given for every part of the body as well as exercises of co-ordination, and they are arranged in a certain sequence in order that the best effects may be obtained from them.
- iii. *Progression.*—The lessons are always arranged according to the capacity of the individuals for whom they are intended, gradually increasing in difficulty from week to week and month to month so as to ensure steady and systematic progress throughout the whole course of training.
- iv. *Continuity of training.*—In order to ensure the desired result, it is essential that the training should proceed regularly to its conclusion, unspoilt by interruptions.

3. CLASSIFICATION OF EXERCISES

The exercises are arranged in the following groups, viz. :—

- Sec. 32. Marching and running exercises.
„ 33. Leg exercises.
„ 34. Neck exercises.
„ 35. Arm exercises.
„ 36. Co-ordinating exercises.
„ 37. Heaving exercises.
„ 38. Lateral exercises.
„ 39. Balance exercises.

- Sec. 40. Abdominal exercises.
 „ 41. Dorsal exercises.
 „ 42. Jumping and vaulting.
 „ 43. Horse work.
 „ 44. Ground work.
 „ 45. Final and corrective exercises.

Certain special exercises are also added for practical application in the field.

The name of each group indicates broadly the part of the body specially affected by the exercises which are included under that head.

Some of the groups are closely related to others and the exercises in each group have also some of the effects of other groups. It is therefore sometimes difficult to decide under which group certain exercises should be classed, but the rule has been followed of classifying the exercises according to the *principal* effect produced by them and in cases in which this is difficult to determine, the exercises are included in the group in which it is more practical and convenient to take them, *e.g.*, the exercise of **Upward circling**, although it has a strong abdominal effect, is taken under the heaving exercises as it has an equally strong effect on the heaving muscles, and, as it is performed on the same apparatus as many of the heaving exercises, it is more convenient to take it under that head.

The Leg, Neck, Arm, and Trunk (Lateral, Abdominal and Dorsal) exercises have special *local* effects, and the exercises of the other groups, in addition to certain *local* effects, have also a more *general* effect on the system as explained under the various group headings.

4. THE DAILY LESSON

1. In selecting the exercises for the daily lesson the following principles should be observed :—
 - i. Exercises should be selected from every group.
 - ii. Easy exercises should be employed at the commencement of the lesson to prepare the body gradually for stronger work.
 - iii. The stronger exercises should then be taken, the most vigorous being taken towards the end.
 - iv. A few easier exercises should be taken at the end of the lesson so as to avoid too sudden a passage from the harder work to other occupations.
2. In accordance with these principles the exercises should be arranged in the form of a table as follows :—
 - i. Marching and running exercises.
 - ii. Introductory exercises, *i.e.* :
 Exercises for Leg, Neck, Arm, and Co-ordination.

- iii. General exercises, i.e. :
Heaving, Lateral, Balance, Abdominal and Dorsal.
- iv. Agility exercises, i.e. :
Jumping and Vaulting.
Horse Work.
Ground Work.
- v. Final and Corrective, i.e. :
Leg, Neck, Arm, Corrective.

3. The above is not only the order in which the exercises are entered in the table, but is also the order in which they should be performed in the lesson. This arrangement of the exercises is generally recognized as the best and most practical for obtaining the fullest benefit from the day's lesson, taking into consideration the quickened progression due to the recruit's tables being only eight in number.

4. The following are some of the reasons for the adoption of this particular sequence of exercises :—

A lesson, taken as a whole, should consist of a series of exercises, easy at the commencement and gradually increasing in strength and vigour towards the latter part, then decreasing in strength at the end so that at the conclusion of the lesson the circulation, which has been considerably accelerated by the stronger exercises, is sufficiently restored to its more normal state to enable the pupil to proceed to his other work without any feeling of undue agitation or fatigue. In the course of a lesson, short periods of comparative rest are arranged for by taking a comparatively easy exercise after a harder one or an exercise which gives totally different effects.

The lesson is therefore commenced with marching and running on account of their general effect upon the whole body, and upon the circulation in particular, or with a series of *Introductory exercises*, of sufficient range to cover the whole body generally, and is concluded with a short series of easy and comparatively quiet *Final exercises*.

5. As regards the general and agility exercises of the table. The agility being the most vigorous are placed after the general group to accord with the general principle of gradually working up to the more vigorous exercises.

In the general exercises the *Heaving group*, being a strong one, is best taken after the *Introductory exercises* when the body is warm. The *Lateral group* should follow the Heaving, and the Balance, which requires brain and nerve control rather than muscular strength, after the Lateral.

The *Balance exercises* afford rest to the body before the stronger *Abdominal* and *Dorsal exercises* which follow.

The order in which these two Trunk exercises are taken is not of absolute importance, but it is probably better to adhere as a rule to the order indicated above, finishing with the *Dorsal exercises* on account of the special effect of the exercises of this group in correcting any tendency towards loss of carriage which may have crept in during the other exercises.

6. By following the above principles the whole body is dealt with harmoniously in every lesson and nothing is neglected. It is possible to put more work into the time available for the lesson when the exercises are taken systematically in an order definitely arranged beforehand. The work is also performed more easily and with better advantage when the exercises are arranged, as indicated, with steady progression from the easier to the harder, and the passage from rest or easy work to hard work and back again is not too sudden.
7. These, then, are the main principles on which the daily lesson is arranged. The following important details should, however, also receive careful attention :—
 - i. Exercises chosen from one group should not have effects too similar to those chosen from another group, e.g., it is not advisable to use **Lunging outward** and **Lunging forward** as Leg exercises and again as Lateral or Dorsal exercises respectively in the same table. This rule also applies to the selection of auxiliary arm movements.
 - ii. It is sometimes advisable to add a *complementary* exercise or a *supplementary leg* exercise (which is not laid down in the table) after strong exercises for the upper part of the body. These additions should not, however, be made unless there is a necessity for them. It is a question for the instructor to decide according to the circumstances.
 - iii. A *Corrective* exercise should also be taken during the course of lesson when occasion requires in accordance with the principles indicated in Sec. 46.
8. As regards the *complementary* exercises mentioned in the last paragraph—after the performance of exercises which have a strong special effect in one direction, certain exercises of an opposite nature are taken as *complementary* to them, e.g., after *Climbing*, *Arms flinging*.
9. The above-mentioned *supplementary leg* exercises are usefully employed after strong *Heaving exercises* or exercises of a vigorous nature. Easy *Leg exercises* (especially the *Knee bendings*) are used for this purpose.

5. PROGRESSION

1. It is not sufficient to select a few exercises, however good they may be in themselves, and to practise them until the execution is perfect, even though the selection and arrangement of these exercises may be in full accord with the principles laid down for the daily lesson.

2. In selecting the exercises used in the training generally, the first consideration has been their effect on the heart and lungs, and no exercise, the effect of which on these organs is in any way injurious, has been included in this manual.

There are, however, certain exercises which may be too severe for or actually injurious to the heart of a beginner, but which may be performed with advantage by this same man when he has been some time under training. It is all a question of steady progression by means of which the body in general and the heart and lungs in particular are gradually strengthened and worked up to a state of fitness to discharge the work required of them.

3. The exercises in each group are arranged to admit of this progression, the earlier exercises consist of the simplest and easiest movements suitable for the weak or untrained recruit, and they gradually increase in difficulty and strength towards the end so that a selection can be made from these latter exercises sufficiently advanced to give plenty of work and full benefit from that work to the strongest man.

4. In order, therefore, to obtain the required results, a progressive selection of exercises should be made from each group and a series of tables drawn up, each successive table being made slightly more difficult than the one preceding it according to the progress of those under instruction, so that the beginner may be worked up gradually to as high a standard of proficiency as can be attained in the time available for training.

5. The danger of attempting to hurry physical training should be recognized by all. It is impossible to obtain good results by cramming more and harder work into the same or less time. If, therefore, a shorter time than usual is available for the training, the work must not be hurried or increased but should be regulated accordingly, and no attempt must be made to attain the same standard that can be reached in the longer period of time.

6. Unless continuity of training is observed, proper progression is impossible, and much harm may be done to individuals deprived of it.

6. TRAINING OF LARGE NUMBERS

1. An important consideration when dealing with the training of a number of men is that the exercises should admit of being performed by a considerable number at the same time, in order that the time available for instruction may be utilized to the best advantage. The majority of the exercises in this manual are suitable for this kind of training.
2. The strong and active must not have special attention at the expense of the weak and clumsy, but rather the other way. The object is to train every man to a reasonable state of efficiency, and not to train a few only who are naturally athletic to a very high standard. It is the weak and awkward men, therefore, who require the most attention.

CHAPTER III

FORMATION OF CLASSES AND CONDUCT OF PHYSICAL TRAINING

7. GENERAL REMARKS

1. Physical training is to be regarded as a science of bodily movement, and it should be realized that in every bodily movement there is an expression of the mind.

(For example, an *extensor* movement expresses reaching out, i.e., an action of acquisition or aggression ; a *flexor* is one of contraction and suggests protection or concentration ; a balance exercise is the physical expression of self-control, whilst a rotating movement conveys to the mind a sense of rhythm or relaxation.)

By these and similar physical movements an attitude of the mind is revealed. It is not an exaggeration to say that an instructor who studies the mental rather than the physical aspect of physical training can get a shrewd insight into the temperaments, and even the characters, of the individuals in his class. The individual's mental attitude towards bodily movement should therefore be considered, and the amount of energy and effort put into the exercises be particularly noted.

A clear distinction should be made between the individual to whom physical movement is a joy, and who performs naturally and easily most exercises, and the individual who acquires perfection of technique through his own sustained effort. Muscles are toned and strengthened by exercise. This applies equally to the will, for every voluntary movement is an exercise of the will, and, consequently, the greater the self-effort behind the movement, the greater the action of the will.

2. The will can be defined as the power which, in its mental aspect, enables us to command our minds and bodies, thus forcing them to undertake unpleasant tasks for the sake of high ideals. In its physical aspect it indicates endurance. The will is therefore the backbone of character, the formation of which should be the aim of the instructor. He should so inspire his class that the will of each individual is developed along that line of interest which the instructor has created.

8. ARMY BOYS

1. The physical training of army boys cannot be undertaken without first considering their individual character. Collectively they can be said to possess the definite ambition to function as soldiers from the very start of their careers ; consequently they have a strong inducement to exert the necessary effort required for progress. By reason of their youth, they are active, energetic, healthy, and have acquired some idea concerning discipline ; but their will-power, and with it their character, requires to be trained in the right direction. The importance of this factor must be realized by all instructors, who should therefore set themselves the task of developing each individual character rather than forcing all into a uniform pattern.
2. The characteristics which should be chiefly stressed are accuracy, self-respect, energy, punctuality, obedience, tidiness and cleanliness. Of these the first—accuracy—is perhaps the most important, as it inculcates the habit of performing every act with precision. It should therefore be continually kept before the boys' minds in order to perfect them through their own efforts.
3. Over-enthusiasm leading to unnecessary strain must, however, be avoided, and exercises acting directly on the will, such as balance exercises, should predominate. In particular the absolute control of the body should be insisted on after any agility exercises have been performed.
4. Two hours' physical training a week is sufficient for most boys. The periods should not normally exceed half an hour ; but can be extended to one hour by the addition of exercises on apparatus, where such exists. The training should be carried out when the boys are fresh. The tables should be light and varied, though for accuracy they should include exercises of considerable technical difficulty. Balance exercises for developing the power of concentration should be interposed, while rigid adherence to drill movements must be insisted on after the freer exercises.
5. Throughout the whole training the instructor must study each individual, and must never lose sight of the fact that he has in his hands the power to advance or curtail the development of the boy's character.

9. RECRUITS

1. By the term "Physical Training" is meant the regular prescribed course of physical training under qualified instructors that a recruit is required to undergo in order to fit him to take his place in the ranks.

The same instructor should invariably remain with the same class throughout their course of instruction, or until the men leave the depot, or are transferred to another station.

2. While a squad is forming at a depot the physical training of recruits will commence as soon as possible after arrival, and will be continued every working day at the rate of one attendance of one hour daily for six days a week until the course is completed.

When the squad is formed the recruits will commence Table 1. The size of the squad for physical training should never exceed twenty, except during massed work under the senior instructor. The number of attendances which infantry recruits are required to undergo at their depots is 95.

Opportunities may be made use of to increase these if possible, with a view to expediting the number which a recruit is required to perform before he can be dismissed from physical training.

The number of attendances laid down are as follows :—

Infantry	...	...	95
Cavalry	...	...	70
Artillery	...	...	60
R.E. sappers	...	...	65
R.E. drivers	...	...	43
R.T.C.	...	...	95
R. Corps of Signals	...	...	60
R.A.M.C.	...	...	60
R.A.S.C.	...	...	60

It is, however, pointed out that an attendance to be properly constituted must be taken by a recruit in his squad under a qualified instructor ; and the principles of the daily lesson taken once a day in suitable progression must be adhered to.

3. Every facility should be given to encourage the voluntary attendance of the recruit in the gymnasium at the appointed hours in the evening. This is a valuable period for the development of self-effort.
 - i. Weak men are brought on, which saves them from being relegated.
 - ii. The keen ones are able to gather confidence and stimulus for good work by self-effort to improve.
 - iii. Athletes, boxers, and leaders give evidence of their existence during this hour, and recruits talk with their instructors and a bond of mutual interest is forged.
4. It will occasionally be necessary to keep back weakly men under the advice of the medical officer, but the progression of the Physical Training Tables is so arranged that this should be necessary only in very exceptional cases.

Instead of pushing on men of exceptional intelligence, strength, and activity, by transferring them to more advanced classes, such men should be made use of by the instructor to assist him by setting exercises, illustrating the work, etc., and encouraging others by their example. The adoption of this method is productive of more intelligent training, is of assistance in the selection of likely N.C.Os. and raises the style and tone of the whole class without fear of discouraging good men by keeping them back or of overtaxing the remainder.

5. The men should work in vests, shorts (with elastic), socks and shoes. Vests may be discarded in warm weather. Belts, if used, should not be tight, and buckles so placed that they will not damage any apparatus in use.

Too much importance cannot be attached to working in the open air. In cold weather great care should be taken to keep classes on the move.

In inclement weather great coats should be worn in going to and from the gymnasium.

6. It is an important part of the training that men should always be scrupulously clean for their work, and that they should be taught the habit of rubbing themselves down after physical training. Shower baths should be used when available.
7. The proper and free ventilation of the gymnasium should be attended to before, during, and after work ; but the instructor must take care that the men when heated are not kept standing in a draught. It is a matter of great importance that the building should always be kept clean and free from dust.

The floors of gymnasia must not be allowed to become slippery.

8. Instruction in physical training should not be given upon an empty stomach, or within at least a full hour of the completion of a meal.

10. TRAINED SOLDIERS

1. The term "Physical Training" is used to denote the physical exercises given to the soldier under squadron, battery or company officers and N.C.Os. after he has been trained, in order to *keep* him fit, and in condition for his work as a soldier. These physical exercises should be given to the men when necessary throughout the year, and especially during the winter months, and whenever the manœuvre and other work of the soldier is not sufficient to keep him in the required condition of fitness.
2. A set of tables suitable for this physical exercise is published in the form of a table card. These tables are arranged progressively on the same general principles as the whole system

of training, and due care should be taken that they are used according to the condition and requirements of the men, *e.g.*, when men are comparatively "soft" on returning from furlough, discharge from hospital, etc., the table of easier exercises should be used.

These exercises can be performed without apparatus, and are arranged so that they can be taken by men who know the exercises, in from fifteen minutes to one hour. They are therefore suitable for regular daily exercise, and may be taken as such whenever required. Undue hurry in working through a table should, however, be avoided.

As these tables are intended to be used under squadron, battery and company arrangements, all regimental officers and N.C.Os. should have a good knowledge of the details of the exercises and principles of their employment. The possession of such knowledge by superintending officers will enable them to vary the exercises according to requirements, to avoid monotony, and by degrees to improve the standard of physical fitness of their men.

The men should also be practised regimentally, as occasion requires, in running and surmounting obstacles on the principles indicated in Chapters VIII and IX.

3. Army Physical Training Staff Instructors are expressly forbidden to take any squads in the Trained Soldiers Tables other than for the purpose of training regimental N.C.Os., etc., to be instructors.

CHAPTER IV

ABBREVIATIONS, NOMENCLATURE, EXPLANATION
OF TERMS USED

11. ABBREVIATIONS

A.	= Arms or Arm.	Hse.	= Horse.
A. b.	= Arms bend.	Hvg.	= Heaving.
Abd.	= Abdominal.	Intro.	= Introductory.
A. l. c.	= Arms low cross.	inw.	= inward.
astr.	= astride.	J.	= Jumping.
backw.	= backward.	K.	= Knee or Knees.
Bal.	= Balance.	K. b.	= Knees bend.
b.	= bend or bending.	L.	= Leg or Legs.
C.F.	= Common fault or faults.	Lat.	= Lateral.
cl.	= close or closing.	Mar.	= Marching.
Cor.	= Corrective.	N.	= Neck.
crossgr.	= crossgrip.	N. r.	= Neck rest.
Dor.	= Dorsal.	o.	= open.
downw.	= downward.	obliquegr.	= oblique grip.
Ex.	= Exercise.	outw.	= outward.
F.	= Foot or Feet.	overgr.	= overgrip.
F. cl.	= Feet close.	pl.	= place or placing.
F. full o.	= Feet full open.	pos.	= position.
f.	= firm.	R.	= Running.
Fin.	= Final.	r.	= raise or raising.
fl.	= flight.	Sit pos.	= Sit or Sitting position.
fling.	= flinging.	sidew.	= sideways.
forw.	= forward.	str.	= stretch or stretching.
Gd.	= Ground.	swg.	= swing or swinging.
H.	= Hips.	Tr.	= Trunk.
hang.	= hanging.	turn.	= turning.
Hd.	= Head.	upw.	= upward.
H. f.	= Hips firm.	undergr.	= under grip.
HL.	= Heels.	V.	= Vaulting.
HL. r.	= Heels raise.	Wk.	= Work.
Hs.	= Hand or Hands.		

- i. Parts of the body and names of the groups of exercises are commenced with a capital letter, all other words with a small letter.
- ii. The starting positions, when entailing more than one movement in order to obtain them, are written in the

order in which the movements are commanded ; when these movements are taken separately a comma is used between each ; but when taken together no comma is used, and the order of the movements is given from the feet upwards.

iii. The starting position is printed in small type and bracketted, the name of the exercise (including any additional movements taken to increase the effect) is printed in **thick type**, and the executive word in *italics*.

iv. When there is any possibility of doubt as to whether one or both Arms, Legs, Knees, etc., are meant, an "s" is added to the abbreviation when both limbs are referred to.

12. NOMENCLATURE

1. The name of each exercise, and the words of command for its execution, indicate as nearly as possible the actual movements to be performed. In the case of some of the more simple movements the *name* is also used as the actual word of command ; in these cases the imperative mood of the verb used is employed, and such words as "*Raise*," "*Lower*," "*Bend*," "*Stretch*," "*Place*," "*Turn*," "*Fling*," etc., become executive words, e.g., **Heels raise**.

When, however, the name of the exercise and the exercise itself is more complicated, the present participle of the verb is employed for the actual name, and the imperative mood is used in the word of command, or the name of the exercise (or necessary portions of it) is given as a *caution* followed by the executive commands "*One*," "*Two*," etc., or "*Begin*"—e.g. Name of exercise, **Heels raising and Knees bending**. The words of command for this exercise may be **Heels Raise** ; **Knees—Bend** ; **Knees—Stretch** ; **Heels—Lower** ; or the name may be given as a caution, followed by the executive words, "*One*," "*Two*," "*Three*," "*Four*," or "*Begin*."

It will thus be seen that, as a rule, the present participle is used in naming an exercise, and that the imperative mood, or the name followed by numbers ("*Begin*," if several movements are to be executed, judging the time), is employed in giving the words of command.

The imperative mood is also used to indicate a *position* to be maintained, and the present participle to indicate a *movement* to be performed while maintaining that position—e.g. **Heels raise**, full **Knees bend**, **Head turning quickly** ; or, as it would be written in a Table, K. full b.—**Head turning quickly**. In this case the *Knees full bend* position is to be maintained while the movements of *Head turning quickly* are executed.

In a combined exercise in which two movements are to be taken at the same time, only one *executive* word is used—e.g. in the exercise A. b.—**Foot placing sideways with Arms stretching upward**, the commands should be **Left Foot sideways Arms upward—Stretch**, etc.; or, of course, numbers may be used for the executive words, as indicated above. This method of employing numbers will often be found to save much time and many words of command, and should frequently be employed when taking combined or complicated exercises.

2. In agility exercises, when they are not being carried out as controlled exercises, the executive word "*begin*" should be used, the exercise being carried out in quick succession. If the exercise is being carried out as a controlled one the executive word "*go*" should be given to each student.

13. STARTING POSITIONS

1. Every exercise is performed from a certain position called the "*starting position*." The position of *Attention* is the starting position for the more simple movements, and it must always be taken as the starting position when no other is indicated. Fresh positions are learned from time to time as *exercises*, and many of these positions are then used as starting positions for other exercises.

Starting positions other than those given in the different groups of exercises may sometimes be taken if it is considered necessary, but the principles of progression and the effect required should be kept carefully in view in their selection.

The effect of an exercise may depend on the starting position from which it is performed, and the *special* effect of an exercise is often contained entirely in the starting position—e.g. Forw. lying, A. b., Tr. backw. b.—**Arms stretching upward**; the starting position here contains the required dorsal effect, and the stretching of the arms is added to increase it.

2. In order to inculcate the habit of running on the Toes as opposed to running on the Heels, the first movement before beginning to run should be to rise on the Toes.

14. ADDITIONAL MOVEMENTS

In some exercises additional movements are added to obtain certain effects. When such additional movements are intended to be taken at the same time as the main movement of the exercise, the word "*with*" is added before the name of the additional movement—e.g. **Heels raising and Knees full bending with Arms raising sideways and upward**. In this case the movements of the arms are to be taken at the same time as the movements of the legs.

CHAPTER V

METHOD OF INSTRUCTION AND HINTS TO INSTRUCTORS

15. GENERAL REMARKS

1. The object of a Manual of Physical Training is :
 - i. To help the instructor to realize the scope of his own rôle.
 - ii. To act as a book of reference and assist him in the study of the science of physical training.
 - iii. To serve as a guide to the method of training recruits according to the principles of training and the objects set forth in Sec. 1.

Physical training is a science ; teaching it is an art.

The key to good instruction is to establish a relationship with the pupil based on mutual understanding.

The question of leadership plays an important part in physical training. The mere power to set in ordered motion a squad of soldiers by means of an approved method is not physical training. It is true that where military training has to be considered, uniformity, precision, instant obedience to a word of command, and other military virtues cannot be relaxed or foresworn. Nor is there any reason that they should be. The instructor must foster and use them, while at the same time endeavouring to create interest in order to awaken self-effort in the pupil. Without *self-effort* on the part of the pupil physical training becomes so much hard labour ; this places a gulf between him and the instructor which nothing else can bridge.

2. There are three qualifications necessary for the make-up of a P.T. instructor.
 - Knowledge of his subject.
 - Understanding of each pupil.
 - Interest in his work.
- i. Knowledge of his subject includes :
 - (a) Keeping the object of the training always before him.
 - (b) Being steadfast to the principles that govern the training.
- ii. The establishment of mutual understanding.

- iii. "Interest in his work" is entirely dependent upon his belief in the future of his pupils, and in his own capability to stimulate and assist them in *their* efforts to attain it.
3. Every instructor realizes the importance played by personality, and consequently is sometimes apt to be over anxious lest he should be lacking in this vital particular. But if he will realize that, as there are no two human bodies quite alike, so no two personalities can ever quite express human quality in the same way, then he can devote himself to his pupils without worrying about his own personality.

He should have a thorough knowledge of the principles of physical training, and of the objects and effects of the various exercises employed, and, in addition, possess the power of handling a class to the best advantage, and of imparting instruction in such a way as to encourage the men to try and improve *themselves*.

- He should endeavour to arouse the men's interest in the work by pointing out how the exercise they are performing helps some other form of military training or sport. At all costs he should avoid making it irksome to them, and while maintaining good discipline and full control of his class, should avoid all stiffness and rigidity, encourage individuality, freedom of movement and an intelligent understanding of the object and value of the training.
4. The instructor should avoid all loud shouting, and noisy, impatient, discouraging and bullying methods of handling his class. A quiet, encouraging manner, free from hesitation and indecision, is productive of the best results. The recruits should be made to realize that noisy movements are a sign of the untrained man.
5. It must also be remembered that men are not all alike, but have different characters, temperament and capabilities, and that they require handling accordingly.
6. Care must be taken that men are kept on the move as much as possible. Long periods of rest are wasteful and boring. They should *always* be ordered to stand easy if waiting for other men of the class to perform an exercise; but should be directed to watch their performances and take note of the instructor's remarks and corrections in order that they in turn may profit by them. The instructor must exploit every means to make his pupils observant.

The men should never be kept too long in one position, especially a constrained one. An exercise should never be performed so many times that it becomes wearisome, and the strength and endurance of the men should never be pushed

to extreme limits. Great care must be exercised in this respect, and no exercise should ever be performed a greater number of times than can be accomplished without loss of style and position, or the otherwise good effects of the exercise will be counteracted.

7. Keeping in view the important principles of gradual and easy progression, the instructor must note that there should not only be progression in the amount and strength of the actual muscular work, but that there should also be progression in accuracy and precision of execution, and in activity and quickness of movement.
8. Before commencing a lesson the instructor must carefully study the table to be performed.

16. DEMONSTRATION OF EXERCISES

1. As a general rule the instructor should adopt the following principles of the art of Teaching Physical Training Exercises :
 - i. *Demonstrate* the exercise.
 - ii. Allow the pupil to *attempt* it.
 - iii. Make *corrections*.

(*Note*.—Corrections can best take place during the “attempt” in order to save time.)

2. The instructor, when demonstrating, should, as a rule, take up a position in which he can see every man in the class, and they can see him without moving or turning their heads very much from their front. He should not, therefore, be too close to the class, or too far away. This does not mean that he is always to remain stationary, but that he should place himself where he can, according to the circumstances, best control his men, and observe the performance of the exercises.
3. Explanations of exercises should not as a rule be necessary and should be given only when the men are standing easy. They should not be made longer than can be helped, and should be given in simple language which can be easily understood by the men and not necessarily in the words of the book.
4. It should as a rule only be necessary to give a demonstration of a new exercise, or of the new portion of an exercise. This should be done immediately before it is performed. The class should therefore be formed up or opened out ready for the exercise, apparatus in position, etc., as the case may require, before the demonstration is given.
5. Exercises should be illustrated either by the instructor himself performing them, or by causing an assistant or a smart pupil to perform them.

Most new exercises should, as a rule, be set by the instructor himself, but in many instances attention can more easily be drawn to its special features by making an assistant or one of the class set it. And this method should always be adopted when the exercise involves assuming positions which are difficult to maintain while speaking, and from which it is impossible to see the class.

In setting "Free standing" exercises, the instructor or his assistant should face in the direction which will best enable the men to see the particular positions or movements, *e.g.*, facing the class or turned sideways to it, as the case may require.

New exercises, where apparatus is used, should be set by the instructor, and also agility exercises in the daily lesson.

The better the instructor the less he will talk, and the less explanation will be necessary.

17. CORRECTING FAULTS

1. The instructor should remember that exercises which are well known to *him*, and which have become easy by practice, are new and often difficult to the pupil. He must not, therefore, be impatient of faults, neither must he expect perfection of execution too soon. Any endeavour made to obtain correctness of execution too suddenly is contrary to all sound principles of physical training. Just as the progress of the recruit from week to week and month to month should be steady and gradual, so also should the correction of his faults in each exercise be gradual. All the faults in an exercise should not be corrected at once, but the most important faults should first be put right, and later on those of less importance. The capabilities of the men must be carefully observed, and judgment must be exercised in deciding when to exact perfection of execution and when to be satisfied with a reasonable attempt.
2. In order that the men may be enabled to recognize their own faults it is a good plan to train them to detect and correct each others. They should also be instructed to bear their own special faults continually in mind, with a view to avoiding them as much as possible.
3. All corrections should, as far as possible, be made at the time by mentioning the fault or rather the correction, shortly to the whole class (*e.g.* "Heads up," "Knees straight," "Stretch the arms fully," etc.), following this occasionally, if necessary, by mentioning the name of the man who is particularly at fault.

The more important corrections should be made when the

men are standing easy, and never when they are in a constrained position. Should it be occasionally necessary *during* a complex exercise to make any considerable correction, or to give any additional explanation, the word **Rest** may be given at any convenient position; the men will then rest themselves easily, and pay attention to the explanation; on the word **Position** (preceded, if necessary, by a caution) they will resume the last position.

The best way of correcting a fault which is habitual, or which has arisen during the course of the lesson, is by the employment of corrective exercises (*e.g.*, **Head bending backward** for bad carriage of head and neck). It should be remembered that a fault is not fully corrected until the habit has been eradicated.

The lesser of two opposite faults may sometimes be permitted in order to correct the greater.

If a man requires special correction, involving considerable attention, he should be taken separately, so as not to waste the time of the others.

18. WORDS OF COMMAND

1. A good method of giving the commands for the various exercises is all important if good results are to be obtained. The cultivation by an instructor of a good word of command is therefore essential.

A *good* word of command does not mean a *loud* one; on the contrary, a loud word of command is frequently a bad one, and is always bad when given to small classes.

Words of command should be regulated according to the requirements of the case. They should be sufficiently loud for every man in the class to hear clearly, and no louder. The pronunciation should be distinct, and the intonation and manner of giving the command should suit the particular movements required. In fact, the word of command should, as it were, help the men to perform the exercise.

2. Every command should consist of two parts—*cautionary* and *executive*.

The *cautionary* part of the command should contain short but clear information as to what is required and how it is to be done. It should, in fact, indicate as closely as possible the movement to be performed, and must therefore be given clearly and distinctly, so that there can be no doubt whatever as to what is wanted. The tone of voice and method of delivery should, however, convey the idea that a *command* is being given, as distinct from an *explanation*, and should prepare the men

for the movement by making them, as it were, "lie in wait" for the executive word.

A monotonous tone should therefore be avoided, but a sharp or jerky pronounciation of any word in the cautionary part of the command, which might cause the men to move prematurely, should also be avoided.

The *executive* word is only required to mark the actual point of time at which the movement is to be executed. This word or syllable, should be given sharply (not necessarily loudly) or smoothly, according to whether the movement is to be quick or slow.

A pause is necessary, and should always be made, between the *cautionary* and *executive* words, so as to give the men time to prepare the nerves and muscles for the movement. Such preparation should, however, be an inward one only, and should not be visible to the eye. With beginners the pause should be rather longer than with more advanced men, as they take longer to prepare. It is occasionally useful to vary the length of the pause for advanced classes, in order to exercise their nerve control.

3. Whenever the word of command does not sufficiently indicate the movement to be executed until the executive word is reached, it must be preceded by an additional caution indicating the exact nature of the exercise—e.g., the commands **Left Foot outward—Place** and **Left Foot outward—Lunge** should be preceded by the cautions "*Foot placing*" or "*Lunging*" respectively.

The command **Halt** should be used when an exercise is being performed "judging the time," and it is required to stop in any particular position.

19. ONE-SIDED MOVEMENTS

All one-sided movements will be commenced to the *left*, or with the *left* arm or leg, as the case may be, and will be performed an equal number of times to the *right*, or with the *right* arm or leg. Such exercises are, as a rule, for the sake of convenience, described under the various group headings and in the tables for one side of the body, one leg or arm only, but apply equally to the other side.

20. COMBINED MOVEMENTS

Before taking an exercise, or assuming a starting position, which involves a combination of movements, each movement should have previously been taught separately as a distinct exercise.

When it is required to execute such combined movements *at the same time* the rule to be followed is—that the movement should be *completed* together, *e.g.* :

- i. When combining a comparatively slow leg movement with a quick arm movement, the arm movement should not be commenced until the leg movement is nearly completed, so that they may both be finished at the same moment.
- ii. When the exercise consists of two movements of the arms and one of the legs, the first movement of the arms should first be taken without moving the legs, and the movement of the legs and the second movement of the arms should then be taken and completed together.
- iii. In all movements, or combination of movements, under the following headings, viz., "Leg"; "Neck"; "Arm"; "Trunk"; a distinct pause should be observed after each movement, *e.g.*, "Right turn"; "Foot placing sideways" (judging the time); "Arms stretching upward." The object of this is to emphasize control.

21. PREVENTION OF ACCIDENTS

The surest way of preventing accidents is a careful adherence to the principles of gradual progression.

The instructor must, however, be prepared to "save" men from hurting themselves whenever there is any possibility of their falling in the performance of an exercise. It is in the various vaulting exercises that this is most likely to happen.

The instructor should stand on the far side of the horse, beam, etc., and be prepared to save the pupil by grasping the upper part of the body, *never the legs*, if there is any chance of his hurting himself, so as to save the fall.

In "saving," care must be taken that the performance of the exercise is not interfered with if there is a chance of its being done safely. The men should not, therefore, be "saved" unnecessarily.

It gives men confidence in the early stages of their training to know that the instructor is "standing by" to "save"; but it must be remembered that men should be trained to rely upon themselves, and to have confidence in their own powers. As the men gain confidence, strength and skill, the instructor should therefore gradually dispense with this assistance, only "standing by" for an occasional man who requires it.

A slippery floor, besides preventing the proper performance

of exercises, is a continual source of danger, and great care should therefore be taken that the floors of gymnasia are not allowed to become slippery.

22. MASSED WORK

Several classes may occasionally be taken together under one instructor ; but it must be remembered that massed work is used, not for the purpose of regular instruction in details (which can only be properly given in small classes), but as a change from the ordinary class routine, and to see how the instruction has been conducted. New exercises should not, therefore, be given to massed classes, long explanations should be avoided and classes of different standing as regards their instruction should *not* be massed together.

Massed work, taken as here indicated, gives an idea of special importance to the training, and the men are therefore likely to put their best work into it. It should never be taken too frequently, or be continued for too long at a time. It is sometimes practical to take the Introductory and Final exercises of a table in this way.

23. NEW INSTRUCTOR TAKING OVER PARTIALLY TRAINED CLASS

When a fresh instructor takes over a partially trained class he should repeat the last table performed by the men before proceeding to the next ; and if any considerable interval in their training has elapsed, it might be necessary to re-commence more gradually by repeating some of the earlier and easier work till the men are fit to carry on where they left off.

CHAPTER VI

CLASS ARRANGEMENTS, Etc.

24. DRILL MOVEMENTS

1. *Formation of the class.*—

The class will be formed for physical training in two ranks, each man occupying a front of 24 in.

Each man in the rear rank will cover a man in the front rank, at a distance of two paces (60 in. from heel to heel), the two men thus forming a *file*.

The men will always fall in in the *Stand-at-Ease* position.

2. *Falling in and changing position.*—

The instructor should occasionally place the right-hand man in, or direct him to take up, a certain position, and give the command **Fall-in**; the men will then fall in on the right-hand man, take up their dressing and stand at ease as quickly as possible, each man moving independently without jostling or noise.

This method of changing the position of a class or classes should frequently be employed, so as to save many of the purely "drill movements" of *turning, marching, halting*, etc., besides a considerable amount of time and a number of words of command.

3. *Quitting ranks and re-forming (moving "free").*—

Whenever the men fall out and re-form as above, or when individual men, files or fours leave their places in the ranks for any purposes whatever (e.g. to perform an exercise, to move apparatus, etc.), they should invariably move at a "free" double the shortest and easiest way, as quickly and smartly as possible, running lightly on the toes, maintaining a good carriage, and carefully avoiding all slouching, heaviness of movement, stiffness and constraint. By the adoption of this practice the men are trained to habits of quickness, activity, and easy movement, and the value of the day's lesson is thereby enormously increased.

Men returning to their places after performing an exercise will (moving freely, as described above) pass by the flank and rear of the class, and, on reaching their places in the ranks, will halt and stand at ease smartly, and then stand easy without making any unnecessary turnings, or introducing superfluous "drill movements."

The word "free" is applied to all movements made with the freedom, combined with smartness, described in this paragraph; and when a position or an exercise is ordered to be taken "free," the position should be assumed direct or the exercise performed freely without precise adherence to the detailed movements.

Moving "free" must not, however, be confused with the "Free standing exercises," which is the term applied to all exercises which are performed without apparatus.

Before leaving his place in the class to perform an exercise, etc., each man will spring to *Attention*, and rise on his toes preparatory to running, this will ensure the moving forward on the toes. Care should be taken in the effort of rising on the toes that shrugging the shoulders or pushing the abdomen forward should not occur.

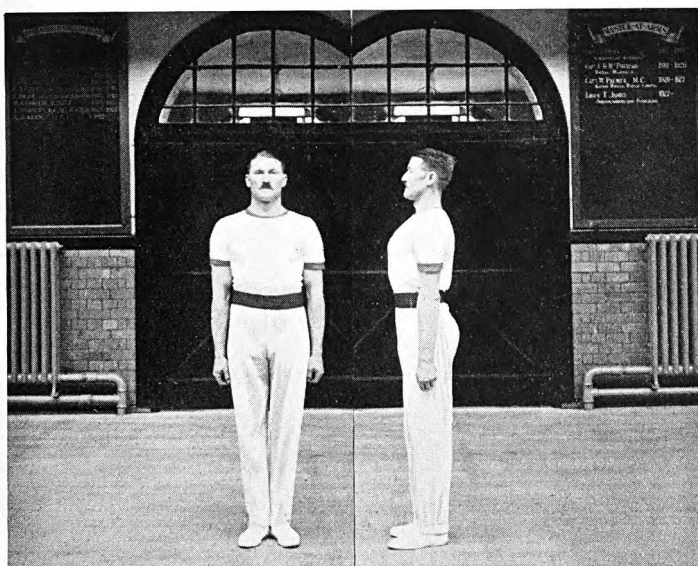
4. *Position of attention.*—

Heels together and in line. Feet turned out at an angle of about 45 degrees. Knees straight. Trunk erect and carried evenly over the thighs, with the shoulders (which should be level and square to the front) down and moderately back—this should bring the chest into its natural forward position, without any straining or stiffening. Arms hanging easily from the shoulders as straight as the natural bend of the arm when the muscles are relaxed will allow. Wrists straight. Hands closed but not clenched. Backs of the fingers touching the thigh lightly, thumb to the front and close to the forefinger, thumb immediately behind the seam of the trousers. Neck erect. Head balanced evenly on the neck and not poked forward, eyes looking their own height and straight to the front.

The weight of the body should be balanced on both feet, and evenly distributed between the fore part of the feet and the heels.

The breathing must not in any way be restricted, and no part of the body should be either drawn in or pushed out.

The position is one of readiness, but there should be no stiffness or forced unnatural straining to maintain it.



POSITION OF ATTENTION

5. Common faults (position of attention).—

i. Neck allowed to incline forward. ii. Shoulders *forced* back. iii. Shoulders raised. iv. Shoulders (from slackness) allowed to fall forward. v. Small of the back unduly hollowed. vi. Abdomen protruded. vii. Abdomen drawn in. viii. Hips drawn back. ix. Elbows sticking out. x. Backs of the hands to the front. xi. Elbows held too far back. xii. Body and arms stiffened. xiii. Breathing restricted.

Note.—It should be noted that a correction of the carriage of the neck will usually have the effect of correcting the carriage of the whole body.

It must also be noted that a recruit who has had no previous training cannot be expected to obtain this or any other position correctly at once, and that attempts to correct his positions too suddenly are certain to have injurious rather than beneficial effects. The principle of gradual and not forced or hurried progression should therefore be most carefully kept in view, and the instructor must be satisfied with any improvement, however slight, providing it is steadily and gradually maintained.

It will be found to be of material assistance in training men to obtain a good position, and a correct carriage of the whole body, to direct them, during the first few weeks of their physical training, to stretch the arms and fingers fully downward when assuming or returning to the position of *Attention*. This downward stretching of the arms should be considered as an *exercise* which is only intended to be used during instruction in physical training to improve the carriage of the shoulders, head, and trunk.

6. Standing at ease.—

Stand at—Ease. “*Ease.*”

Keeping the legs straight, carry the left foot about one foot-length to the left so that the weight of the body rests equally on both feet, at the same time carry the hands behind the back and place the back of the right hand in the palm of the left, grasping it lightly with the fingers and thumb, and allowing the arms to hang easily at their full extent.

This position must be taken by the recruit whenever he falls in for instruction.

Attention. “*Attention.*”

Spring up to the position of *Attention* described in para. 4 above.

7. *Standing easy*.—

Stand—Easy. “*Easy.*”

The men will be permitted to move freely without quitting their ground.

The command *Stand Easy* should be given whenever a rest is required, and whenever it is necessary to give any explanations. It should invariably be given when, for any reason, a class is obliged to wait before proceeding with the instruction, or when the instructor's attention is temporarily called away from his class. On the caution *Class* the men will at once resume the *Stand-at-Ease* position.

Although when standing easy the freedom of movement of the limbs should not be restricted, the men should never be allowed to adopt slouching attitudes which would tend to counteract the value of the exercises employed in their training.

8. *Dressing*.—

Right (or Left)—Dress. “*Dress.*”

Each man, except the man on the named flank*, will look towards the flank by which he is to dress with a smart turn of the head, and, commencing with the man nearest the flank by which the dressing is made will move up or back to his place successively, each man occupying 24 inches of front.

The men of the rear rank will cover their front rank men at a distance of two paces.

Eyes—Front. “*Front.*”

As soon as the dressing is correct the instructor will give the word, and each man will turn his head and eyes smartly to the front.

Whenever ranks are closed after having been opened the men will at once look to the *right*, take up their dressing from that flank, and look to the front again without word of command.

9. *Numbering*.—

In twos—Number. “*Number.*”

Without turning the head the front rank will number—*One, Two, One, Two*, and so on from right to left.

10. *Stepping forward, backward, and sideways*.—

One pace forward—March. “*March.*”

Take a full pace of 30 in. forward with the left foot, carrying it close to the ground and pointing the toe downward, place it on the ground toe leading and close the right foot to it smartly without stamping.

One pace step back—March. “*March.*”

Take a full pace of 30 in. backward with the left foot, and close the right foot to it without stamping.

One pace to the left—March (used only in Open Ranks). “*March.*”

Take a full pace of 30 in. to the left with the left foot, place it on the ground toe leading and close the right foot to it smartly without stamping, keeping the legs straight.

A pace may be taken to the right in like manner.

In stepping forward, backward, and sideways the body must be kept erect, but should be carried evenly *with* the foot and *not after* it.

Two or more paces may be taken forward or backward as described above, the heels being closed only on the completion of the last pace.

In taking two or more paces *sideways*, each pace will be taken as described above, except that the heels will not be brought to the ground until the completion of the final pace.

11. Opening and closing ranks.—**Open ranks—March.** “*March.*”

The “Ones” of the front rank will step forward two paces, the “Twos” of the rear rank will step backward two paces, and as soon as the paces are completed all (except the right-hand man of each rank) will look to the *right* and correct their dressing quickly, looking to the front again as soon as it is correct without word of command.

Re-form ranks—March. “*March.*”

The “Ones” of the front rank will step backward two paces, the “Twos” of the rear rank will step forward two paces, and as soon as the paces are completed the class will dress quickly by the *RIGHT*, and look to the front without word of command.

Should it be necessary at any time to take still more space in the ranks, the following method of opening out will be adopted :—

To the left to full (half) Arm interval—Extend. “*Extend.*”

The file on the right will remain still, and the remainder will move outward from that flank as rapidly, smartly, and lightly as possible. Each man in the front rank will, as soon as he obtains his approximate interval, raise his right arm, hand, and fingers extended horizontally palm downward, look to the right

and dress at full arm interval from the man next him. The rear rank will cover correctly. (If half-arm interval is ordered the hand will be placed on the hip instead of the arm being extended.)

The extension may be made to the right in like manner.

Eyes—Front. “*Front.*”

The arms will be lowered smartly to the side without noise, and the whole will look to the front.

The ranks will then be opened as described above on the command **Open ranks—March**, and re-formed again on the word **Re-form ranks—March**.

On the right (or left)—Close. “*Close.*”

The file on the named flank will remain still, and the remainder will close to that flank as rapidly and smartly as possible, take up their dressing and look to the front without further word of command.

When the men have rifles the extension before opening ranks will always be from the *left*.

25. FORMATION OF CLASS FOR “FREE STANDING EXERCISES”

1. Most of the free standing exercises are better performed with the ranks opened out as described in Sec. 24, 11, facing the original front, but some should be taken with the ranks opened out in this manner (without extending to full arm interval) and turned to right or left. After turning the opened ranks, the word **Cover** should, as a rule, be given, and each rank will then cover quickly by the front and remain still.

When it is necessary to perform an exercise with assistance, such as *Foot support*, etc., and with the ranks opened and facing the front, the “*Twos*” should be directed to step sideways one pace to the right, so as to cover the “*Ones*.”

2. Turnings.—

Turning to the right. “*One.*”

Keeping both knees straight and the body erect, turn to the right on the right heel and left toe, raising the left heel and right toe in doing so.

On the completion of this preliminary movement, the right foot must be flat on the ground and the left heel raised; both knees straight, and the weight of the body, which must be erect, on the right foot.

“*Two.*”

Bring the left heel smartly up to the right without **stamping** the foot on the ground.

Right—Turn. “*Turn.*”

Turn smartly as above, observing the two distinct movements.

Turning to the left. “*One.*”

Turn to the left, as described above, on the left heel and right toe, the weight of the body being on the left foot on the completion of the movement.

“*Two.*”

Bring the right heel smartly up to the left without **stamping** the foot on the ground.

Left—Turn. “*Turn.*”

Turn smartly to the left, as above, observing the two distinct movements.

Turning about—“*One.*” “*Two.*” About—Turn. “*Turn.*”

Turn fully about to the right, as described for the *Right turn*, by numbers or judging the time as required.

Right (left)—Incline. “*Incline.*”

As above described, but turning half right or left.

3. *Changing places.*—

When the men of a class are at open intervals, with the rear rank covering the front rank, or the “*Twos*” covering the “*Ones*,” at two paces distance, the places may be changed as follows :—

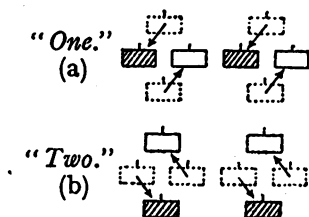
Changing places. “*One*” (a).

The “*Ones*” (or the front rank men, as the case may be) will take a full pace diagonally backward to the left rear and close the heels, and, at the same time, the “*Twos*” (or the rear rank men) will take a full pace diagonally forward to the right front and close the heels.

The two men, on the completion of this preliminary movement, will be in line with one another, midway between the places they originally occupied.

“*Two*” (b).

The “*Ones*” will take a full pace diagonally backward to the right rear, and the “*Twos*” will, at the same time, take a full pace diagonally forward to the left front.



Places—Change. “*Change.*”

The places will be changed, judging the time, in two movements, as described above, care being taken that the heels are closed on the completion of the first movement.

Places will be again changed to the original positions in the same manner, the man in front moving to the rear by the left, and the man in the rear moving to the front by the right.

26. CLASS ARRANGEMENTS FOR APPARATUS WORK GENERALLY

The arrangements given in the following sections have been drawn up with the object of providing a simple method of arranging for the performance of exercises on apparatus by individuals, files, fours, or ranks of a class, without confusion, and, at the same time, avoiding the introduction of complicated “drill movements,” which necessitate the learning of many small and unimportant details, and which require much time for practising to ensure their correct performance, time which can ill be spared from the legitimate training.

It will be seen that the arrangements at the various apparatus all follow the same principles, and provide for the usual situations that arise. Rapidity of performance and freedom of action has been aimed at without confusion or loss of control.

Each gymnasium may require certain special arrangements to suit the apparatus it contains, but the same principle of simplification should be kept in view when dealing with these cases, and the invention and introduction of fancy and elaborate drill movements is prohibited.

When the method of coming out from and returning to the places in class for the performance of individual exercises is thoroughly understood, the men may, if required, be ordered to follow each other in like manner without word of command.

27. CLASS ARRANGEMENTS AT JUMPING STANDARDS, ETC.

1. The class will be drawn up, standing easy, in two ranks facing the jumping standards, parallel to the rope and about 8 paces from it.

2. *Individual jumping.*—

First—File. “*File.*”

The first file will spring to *Attention*.

No. 1—Ready. “*Ready.*”

The right-hand man of the front rank will move out as quickly as possible at a “free” double, and place himself facing,

and 4 paces from, the centre of the rope, his rear rank man at the same time taking his place in the front rank.

Jump. "*Jump.*"

No. 1 of the front rank will jump as ordered, and remain at *Attention* on the far side of the rope, at the same time No. 1 of the rear rank will place himself 4 paces from the centre of the rope.

Next—Jump. "*Jump.*"

No. 1 of the front rank will take 3 paces forward in quick time, turning to the *right* on the third pace, and, breaking into a "free" double, return to his place in class, halt, stand at ease, and stand easy. No. 1 of the rear rank will jump as described, No. 2 of the front rank placing himself in a similar manner 4 paces in front of the centre of the rope, and so on till the whole class has performed the exercise, each man returning to his place by the right flank and rear of the class, the last man receiving the word **Fall in**.

3. *Jumping by files or fours.*—

First—File. "*File.*" Or **First 2—Files.** "*Files.*"

The named file or files will spring to *Attention*.

Ready. "*Ready.*"

As before, but the rear rank men will place themselves on the left of their front rank men, the file, or files, extended in single rank with one pace clear interval, and 4 paces from the rope.

Jump. "*Jump.*"

As before, the men retaining their interval and jumping together, and the next file, or 2 files, taking their places in front of the rope.

Next—Jump. "*Jump.*"

The first file, or 2 files, will take 3 paces forward in quick time, turn to the right, and double back to their places, passing by the *right* flank and rear of the class, each man halting, standing at ease and standing easy independently but smartly, as in para. 2, above; at the same time the next file, or two files, will act as above, and so on.

A succession of jumps may be taken, when the men have attained reasonable proficiency, by arranging rows of benches across the gymnasium, 5 paces between each row. The jumping will then be by fours, as above, each section of fours acting as described. When the first section of fours is at *Attention*, after having taken the first jump, the word **Jump** will be given as a command for them to take the second jump, and for the second section of fours to take the first jump, and so on.

Note.—These exercises may be taken in succession as described in Sec. 28.

28. CLASS ARRANGEMENTS AT VAULTING HORSE

The arrangements and words of command for them will be the same as those described for jumping over the rope by single men, except that the class will be drawn up at the side of the horse, each man when coming out to perform an exercise will place himself at the required distance from the horse, moving at the double, and the executive word for commencing the Exercise will be **Go** instead of **Jump**. Those exercises on this apparatus in which the man does *not* remain stationary on the horse may be performed by the men following one another in quick succession, in which case the command will be given when No. 1 is in position ready to perform the exercise—**In succession—Begin**. Each man will then come out from his place, perform the exercise, and return to his place again in the manner described above, except that he will start his "run down" for the exercise without word of command at about the moment the man in front of him "takes off," and, on "landing" after the exercise, he will, without pause **DOUBLE** forward for the 3 paces instead of taking them in quick time. When the last man of the class has started to perform the exercise No. 1 of the front rank will come out again and the whole class will continue the exercise until the instructor says "last time through," when it will cease as soon as the last man has completed. An exercise should not, however, be taken "in succession" until it can be performed satisfactorily, and there must be no scrambling or carelessness about its execution.

The principle of taking exercises "in succession" may be applied with advantage to many other Jumping and Vaulting exercises (*e.g. Jumping over rope, Heaving jumps, Vault with Foot assisting "taken free," etc.*).

29. CLASS ARRANGEMENTS AT BEAM

1. The class will, as a rule, be drawn up parallel to the beam and about 5 paces from it. The arrangements will then be similar to those described for jumping over the rope (Sec. 27, 2), except as follows:—

When the exercises are performed individually, the waiting man will place himself 2 paces from the beam (4 paces from it if a run is required) each man after having recovered to *Attention* on the completion of an exercise will take the usual 3 paces forward in quick time and return to his place at a "free" double, as before described. The men may also, if required, be directed, to form up on the opposite side of, and facing the beam, in a similar manner after completing the exercise.

2. *By files or fours.*—**First—File.** “*File.*” Or **First 2—Files.** “*Files.*”The named file or files will spring to *Attention*.**Ready.** “*Ready.*”

The named files will double out as before described, and place themselves at once in position for the exercise.

Then after the completion of the exercise—

Next—File. “*File.*” Or **Next 2—Files.** “*Files.*”The next file or files will spring to *Attention*.**Ready.** “*Ready.*”

The next file or files will double out, and place themselves in position for the exercise, and, at the same time, the men who have just completed the exercise will take 3 paces forward in quick time, as usual, and return to their places at the double, as before described.

30. CLASS ARRANGEMENTS AT CLIMBING ROPES

The arrangements will be similar to those described for the beam, etc., Sec. 29, except that a man who has landed with his feet on the ground, and is still grasping the rope, after having performed an exercise, will wait in that position until the word “Next 2—Files”—“Ready” is given. He will then pass by the left of the rope and return to the class, by taking 3 paces forward, turning and doubling, etc., as before described.

31. CLASS ARRANGEMENTS AT WALL BARS

1. The class will be formed up in two ranks in close order facing the wall bars.

Front rank, back against bars—Ready. “*Ready.*”

The front rank, moving “free,” will double the shortest way direct to the bars, and place themselves, one man at each division, with their legs, back, and head touching the bars, each man of the rear rank at the same time placing himself opposite and facing his front rank man, and 5 paces from him.

Front rank, facing the bars (etc. as required)—Ready. “*Ready.*”

As above described, except that the front rank will place themselves a short arm’s length from and facing the bars, or as ordered.

Places—Change. “*Change.*” Or **Rear rank, same exercise—Ready, etc.** “*Ready.*”

The front and rear rank will change places, moving “free,” and passing left arm to left arm, as quickly as possible, and the rear rank will prepare for or perform the exercise as ordered.

2. *Feet support.*—

When low support is required—

On the left Knee—Support. “*Support.*”

The rear rank, or the “Twos,” as the case may be, will kneel down on the left knee, and grasp the feet of the front rank, or the “Ones,” with both hands, keeping the arms and back straight. The position may also be taken on the right knee.

When higher support is required—

With Feet astride—Support. “*Support.*”

As above, except that the supporting rank will take the *Feet astride* position, keeping the arms, back, and legs straight.

The front rank, or the “Ones,” may be ordered to support the rear rank or the “Twos” in like manner. (See Plate 45, Figs. 106 and 107.)

CHAPTER VII

EXERCISES

32. MARCHING AND RUNNING EXERCISES

1. This group includes, beside marching and running, all the exercises of the legs which are performed on the move, which are not included in other groups.

Marching should be light, free, and springy, it should also be economical of the power employed in order that the ground may be covered with comparatively little effort.

No exercise is more used in daily life than walking, but the number of people who walk badly is very large. The ability to cover long distances in the ranks without undue fatigue can only be acquired by practice on the line of march, but it may be stated with confidence that an improvement in the method of walking or marching (which is so essential for a soldier) is best effected by a course of general training which gives full control of the body and limbs, lightness and freedom of movement, and general fitness to the system.

One-sided and insufficient bodily development with its resulting stiffness of joints, heaviness of movement, and lack of control is the most general cause of bad walking. The various forms of *Marching Exercises* together with the *Leg* and *Balance Exercises* are those which are specially employed for the correction of these faults.

All marching exercises are commenced with the left foot, and are usually performed by a class in line or opened ranks whenever conditions permit. The object of marching in line is to improve each man's stride. The correct step should be kept, but men should be allowed to take their most easy and natural length of pace. This is purely a physical exercise and is beneficial in preventing stiffness in marching.

When performing the exercises in this way the men should open out from the front, without word of command, to 2 paces to admit of full freedom of movement.

Running or doubling is included in this group, but is also closely allied to jumping. Its educational value in training men to lightness, activity, ease, and quickness of movement cannot be overestimated. It is also the simplest way, when taken carefully and progressively, of training the heart and lungs,

and thus has a very practical value in training the "wind" and powers of endurance in order that ground may be covered quickly whenever required without undue fatigue.

2. The length of pace and cadence in the various forms of marching are as follows :—

Slow March, 30 in. and 70 to a minute.

Quick " 30 " 120 "

Double " 40 " 180 "

These are the normal paces and cadence for practical use on parade and in the field, but when the *Marching Exercises* are employed as physical training exercises the men are more lightly clothed, are carrying no weights and are wearing light shoes; the cadence may therefore be increased with advantage to about 140 a minute in quick time in order to give more life and smartness and to obtain more value from the movements. And when running or doubling, the pace should be lengthened considerably according to requirements so as to encourage a free and natural stride.

The length of pace and cadence used in other exercises in this manual are as under :—

Astride jumping (Sec. 33, 25)	..	2 foot lengths	and	130 to a minute
Hop with Toe placing sideways (Sec. 33, 26)	..	shortened	"	96 "
Hopping on left Foot (Sec. 32, 14)	..	about 18 in.	"	104 "
" " alternate Feet (Sec. 32, 15)	..	" 18 "	"	104 "
" with Leg raising sideways (Sec. 33, 27)	..	—		130 "
" " opposite Knee and Arm raising (Sec. 32, 20)	..	—		88 "
Knee raise—Double march (Sec. 32, 12)	..	—		140 "
" Mark time (Sec. 32, 10)	..	—		40 "
" Quick march (Sec. 32, 11)	..	shortened	"	40 "
Mark time, with opposite Knee and Arm raising (Sec. 32, 18)	..	—		88 "
Quick march, Heels raise (Sec. 32, 8)	..	about 18 in.	"	130 "
Rapid march (Sec. 32, 7)	..	30 in.	"	140 "
Running on the Spot (Sec. 32, 21)	..	—		180 "
Sideways march (Sec. 32, 9)	..	30 in.	"	112 "
Small jumps (Sec. 36, 9)	..	—		104 "

3. **Quick—March.** "*March.*" (Plate 1, Fig. 1.)

Step off smartly with the left foot in quick time, taking care that the first pace is a full one.

The legs should be swung forward, alternately, freely and naturally from the hip joints, each leg as it swings forward being bent sufficiently at the knee to enable the foot to clear

the ground. The foot should be carried straight to the front, and, without being drawn back, placed firmly upon the ground with the knee straight but so as not to jerk the body.

The body should be maintained as erect as possible, its relative position being as described for the position of *Attention*, well balanced over the legs and carried evenly forward without swaying from side to side, and with head erect.

The arms must not be stiffened but should swing freely and naturally from the shoulders, the right arm swinging forward with the left leg and *vice versa*. If the arms are swung in this way, they will bend naturally at the elbow as they swing forward and will straighten as they swing back, the movement being free without being forced.

- * C.F.—(1) Body inclined too far forward from the hips. (2) Shoulders raised. (3) Body swayed from side to side. (4) Arms stiffened and shoulders brought forward. (5) Arms swung from the elbows only with the upper arm kept still. (6) Arms swung across the body. (7) Knee bent as the foot is placed on the ground. (8) Arms swinging too high forward and not far enough on the backward swing.

Halt. “*Halt.*”

The word *Halt* will be given as the right foot comes to the ground, the moving foot will complete its pace, and the other will be brought smartly up in line with it.

C.F.—Stamping the foot on the floor.

4. With toe leading, Quick—March. “*March.*”

As for *Quick March*, para. 3, above, except that the toe comes to the ground before the heel.

C.F.—(1) Shortening pace. (2) Altering cadence.

5. Quick mark—Time. “*Time.*”

Raise each foot alternately about six inches from the ground, keeping the feet almost parallel to it, the knees raised to the front, the arms steady at the sides, the body steady and the cadence the same as for *Quick March*. (See para. 2, above.)

C.F.—(1) Feet not raised six in. (2) Knees not being lifted to the front. (3) Arms swinging. (4) Body moving. (5) Feet not placed down quietly and in the same place where they came from, causing the man to move forward or backward.

(Quick march.) **Mark—Time.** “*Time.*”

On completing the pace with the advancing foot mark time as above, correcting the covering or dressing as the case may be.

Note.—*Marking time* should never be continued for more than a few paces.

(Quick mark time.) **Halt.** “*Halt.*”

Close the heels and remain at *Attention*.

* C.F. indicates Common Fault or Faults.

6. **Slow—March.** “*March.*”

Step off and march as for *Quick March* but in slow time (70 paces to the minute), keeping the arms and hands steady at the sides, pointing the toes downward and placing them on the ground before the heel, each leg being straightened as it comes to the front before the foot is placed on the ground.

C.F.—(1) Jerky movements of the advancing leg. (2) Not taking a full pace forward. (3) Leaning body backward.

Note.—This is an excellent exercise for gaining control of the limbs and balance of the body in marching, etc.

Halt. “*Halt.*”

As in para. 3, above.

7. (Halt or Quick march.) **Rapid—March.** “*March.*”

As for *Quick March*, but the cadence is increased to 140 paces to the minute.

8. (Quick march.) **Heels—Raise.** “*Raise.*” (Plate 1, Fig. 2.)

Rise on the toes as high as possible, keep the legs straight and, maintaining the same cadence as in *Quick March*, shorten the pace to about 18 in., stretch the arms and fingers downward and keep them steady at the sides. Each step should be taken with just sufficient spring of the ankle joints to prevent stiffness of movement.

C.F.—(1) Inclining the body forward. (2) No spring from the ankles. (3) Hands holding on to the thigh. (4) Bending the knees.

Heels—Lower. “*Lower.*”

Resume the *Quick March*.

9. (H. f.) **In quick time, sideways to the left (right)—March.** “*March.*”

Step sideways to the left with the left foot and close the right foot to it, repeat the movement till ordered to halt, keeping the legs straight, the heels raised, and the body steady. Cadence 112 paces to the minute.

C.F.—(1) Not keeping up on the toes. (2) Not taking a full pace of 30 in. to the side.

Halt. “*Halt.*”

(The command *Halt* should be given when the heels are together.) Take one more pace sideways and at the same time lower the heels to the ground.

10. (H. f.) **With Knee raising—Mark—Time.** (Plate 1, Fig. 3.) “*Time.*”

Keeping the body erect raise the knees alternately till the thigh is at right angles to the body and the lower leg hanging straight

downward with the toe pointing to the ground, the knees should be raised quickly and a distinct pause observed in the raised position. Cadence, 40 paces to the minute.

C.F.—(1) Not having the lower leg hanging straight down.

(2) Wrong cadence.

Halt. “*Halt.*”

Halt as in *Mark Time*, para. 5, above.

11. (From the Halt, H. f., or Quick march, H. f.) **With Knee raising—March.** (Plate 2, Fig. 4.) “*March.*” (Knees—Raise. “*Raise.*”)

Keeping the body erect, raise the knees alternately as in para. 10, above, and move forward. Continue to move forward with the same cadence (40 paces to a minute) with paces shortened, taking care to carry the body well forward over the leading foot as it comes to the ground with the toe leading and the knee straight.

C.F.—As for para. 10, above. (3) Taking too long a pace.

(4) Toe not touching the ground first.

Quick—March. “*March.*” Or **Halt.** “*Halt.*”

Resume the *Quick March* or *Halt* as ordered.

12. (From the Halt, H. f., or Quick march, H. f.) **With Knee raising—Double—March.** “*March.*”

As for para. 11, above. Cadence, 140 paces to the minute.

13. (From the Halt, H. f., or Quick mark time, etc.) **With Knee raising—Double mark—Time.** “*Time.*”

Raising on the toes, keeping the body erect, raise the knees as in para. 10, above, quickening the cadence to 140 to the minute.

C.F.—As for paras. 10 and 11, above, and (5) Body leaning backward.

14. (Quick march, H. f.) **On the left Foot—Hop.** “*Hop.*”

Keeping the body as erect and steady as possible, hop forward on the toes of the left foot, springing from the knee and ankle joints and taking paces of about 18 in., the right leg straight and kept well to the rear, toe pointed.

Feet—Change. “*Change.*”

Swing the right leg forward and hop as above on the right foot. Cadence, 104 paces to the minute, and not more than 6 paces taken with each foot.

Quick—March. “*March.*”

Resume the *Quick March*.

15. (Quick march, H. f., or with Arm movements.) **On alternate Feet—Hop.** (Plates 2 and 3, Figs. 5 and 6.) “*Hop.*”

As soon as the left foot next comes to the ground hop once

on that foot as in para. 14, above, then swing the right foot forward and, taking a full pace with it, hop once on that foot and so on, taking care to maintain the body erect and steady and the shoulders square to the front.

C.F.—(1) Hopping off both feet. (2) Not straightening the rear leg. (3) Making an extra beat with the advancing leg before the hop.

Quick—March. “*March.*”

Resume the *Quick March*.

16. (From the Halt, or Quick march, or Quick march with Hl. r.)
Double—March. (Plate 4, Fig. 10.) “*March.*”

Step off with the left foot and double on the toes with easy swinging strides, inclining the body slightly forward but maintaining its correct carriage. The feet must be picked up cleanly from the ground at each pace, and the thigh, knee, and ankle joints must all work freely and without stiffness. The whole body should be carried forward by a thrust from the rear foot without unnecessary effort and the heels must not be raised towards the seat but the foot carried straight to the front and the toes placed lightly on the ground. The arms should swing easily from the shoulders and should be bent at the elbow, the forearm forming an angle of about 135° with the upper arm (*i.e.* midway between a straight arm and a right angle at the elbow), fists lightly clenched, backs of the hands outward, and the arms swung sufficiently clear of the body to allow of full freedom for the chest. The shoulders should be kept steady and square to the front and the head erect.

C.F.—(1) Not moving sufficiently lightly. (2) Allowing the heels to touch the ground. (3) Moving too stiffly. (4) Not swinging the arms freely and easily, *e.g.* keeping the upper arms too close to the sides, sticking the elbows out, or swinging the arms across the body. (5) Swaying the body. (6) Poking the head forward.

Quick—March. “*March.*” Or Halt. “*Halt.*”

Resume the *Quick March* or *Halt* as ordered.

17. (H. f.) In double time sideways to the left—March.
“*March.*”

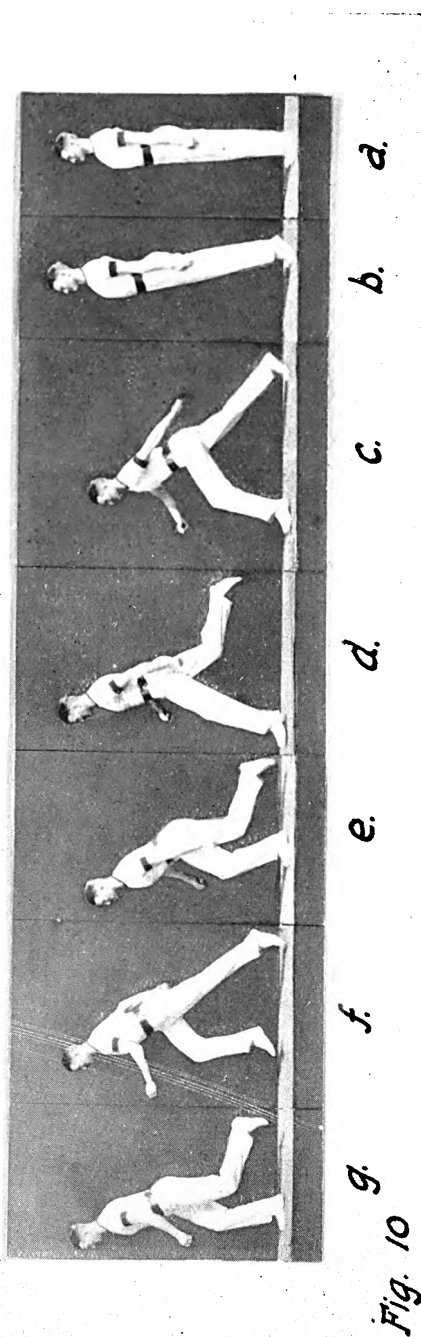
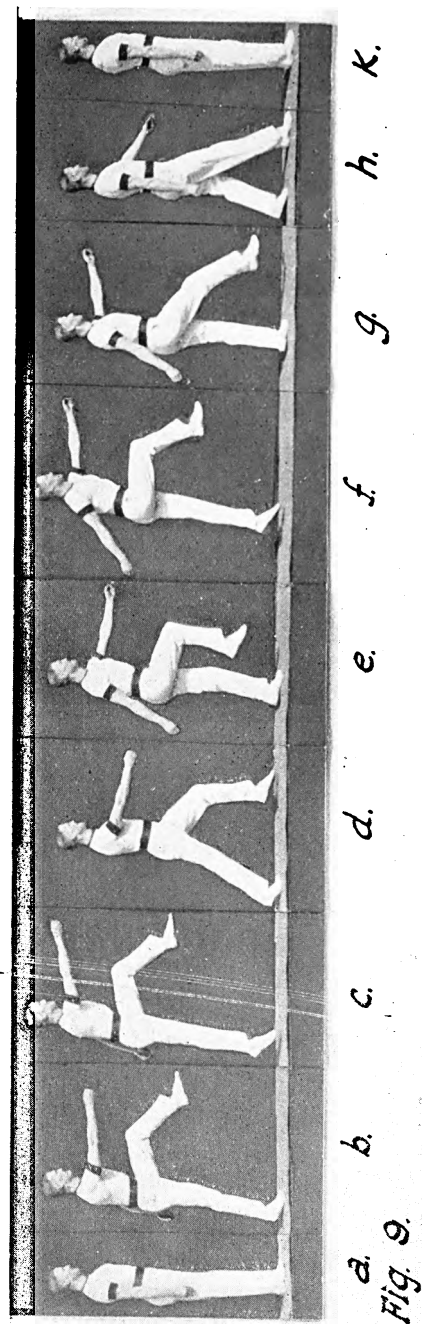
Rising on the toes and keeping the knees straight, take a succession of paces sideways to the left in double time making the movement slight and springy, keeping the body erect and the heels off the ground.

Halt. “*Halt.*”

Close the heels and at the same time lower them to the ground in about 5 beats.

PLATE 4.

M. & R. Ex.



18. (From the Halt or On the move.) **Mark time with opposite Knee and Arm raising.** (Plate 3, Fig. 7.) "*Begin.*"

Raise the knee until the thigh is at right angle to the body, at the same time swing the opposite arm forward in line with the shoulder in a free and easy swing. Cadence, 88 paces to the minute.

C.F.—(1) Making the movements jerky. (2) Raising the same leg and arm. (3) Not swinging the arm sufficiently high.

19. **Marching with opposite Knee and Arm raising.** (Plate 4, Fig. 8.) "*Begin.*"

As for para. 18, above, but moving forward.

C.F.—As for para. 18, above.

20. **Hopping with opposite Knee and Arm raising.** (Plate 4, Fig. 9.) "*Begin.*"

As for para. 18, above, but moving forward with a hop on alternate feet.

C.F.—As for para. 18, above, and (4) Not making a sufficiently forward movement with each hop or spring.

21. (From the Halt.) **Running on the spot.** "*Begin.*"

Raising on the toes commence running on the spot by lifting each foot alternately about 6 in. off the ground. Body leaning slightly forward and arms swinging loosely as in *Double March*. Cadence about 180 to the minute.

C.F.—(1) Body upright. (2) Raising the heels backwards.

22. (From the Halt.) **George's 100 up.** "*Begin.*"

Raising on the toes commence slowly running on the spot, gradually increasing the speed to its utmost limit, then ease up to stop as one would in a race. The arms should be made to move across the body vigorously as the speed is increased.

Remarks.—A good exercise for limbering up in athletics.

33. LEG EXERCISES

1. This group includes simple and easy exercises for the legs as distinct from the more violent exercises of marching, running, jumping, etc. The object and effects of these easy leg exercises, are as follows :—

They provide good starting positions for other exercises, improve the control of the legs and increase the flexibility of their joints and the strength of their muscles. Many of them are also used as *supplementary leg exercises* after some of the stronger exercises for other parts of the body included in the "General Exercises" of the Table.

Being fairly easy, these exercises are well suited for "Final" exercises in the daily lesson.

They are subdivided as follows :—

- Group i. Feet closing and opening. Para. 2, below.
 „ ii. Heels raising and knee bendings. Paras. 3 to 7, below.
 „ iii. Foot placings. Paras. 8 to 18, below.
 „ iv. Lunging. Paras. 19 to 23, below.
 „ v. Kicking and hopping. Paras. 24 to 28, below.

2. Feet—Close (a). "Close."

Raise the toes and close the feet by pivoting on the heels, keeping the knees straight.

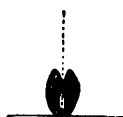


FIG. (a)

C.F.—(1) Raising the feet too high. (2) Scraping the feet on ground. (3) Swaying the body.

Used as a starting position for many *Trunk* exercises, the pelvis being better fixed than it is at *Attention*.

(F. cl.) Feet—Open (b). "Open."

Raise the toes and open the feet to the angle of about 45° as at *Attention*.



FIG. (b)

C.F.—As above.

The normal position of the feet (normal foot-angle) when at *Attention* and unless otherwise ordered.

(F. cl.) Feet full—Open (c). "Open."

Raise the toes and open the feet to an angle of 90°.



FIG. (c)

C.F.—As above.

This is used as the starting position for *Foot placing outward* and for *Lunging*.

Note.—Feet closing and opening may be used for correcting the angle of the feet whenever necessary.

3. (H. f.) **Heels—Raise.** (Plate 5, Fig. 11.) "*Raise.*"

Keeping the heels together, legs straight, body and head erect and well stretched, raise the heels from the ground as high as possible.

C.F.—(1) Heels not together. (2) Knees bent. (3) Body swayed and not kept erect and fully stretched.

An easy exercise for the calf muscles.

Used as a starting position for all *Knee bending*.

If the carriage of the men has been bad during other exercises, this may be taken instead of correcting each man.

Heels—Lower. "*Lower.*"

Lower the heels evenly to the ground.

C.F.—Heels lowered heavily.

4. (H. f.) **Heels raising and Knees bending.** (Plate 5, Fig. 12.) "*One*" or "*Begin.*"

Hl. r. as for para. 3, above.

"*Two.*"

Keeping the heels together and the trunk and head erect, bend the knees outward till the thigh and lower leg form a right angle.

"*Three.*"

Straighten the knees evenly and fully, keeping the heels raised.

"*Four.*"

Hl. lower as for para. 3, above.

C.F.—(1) Heels lowered and separated. (2) Knees not sufficiently outward. (3) Trunk and head not kept erect. (4) Knees not fully stretched.

All *Knee bending* exercises have great effect on the extensor muscles and joints of the leg.

These exercises play a great part in the control required on landing from jumping and all apparatus exercises.

5. (H. f. Hl. r.) **Knees bending and stretching.** "*Bend.*"

As for para. 4, above.

"*Stretch.*"

Remaining on the toes the whole time.

"*Heels Lower.*"

As for para. 3, above.

6. (H. f.) **Heels raising and Knees bending quickly.** "*One*" —"*Two*" —"*Three*" —"*Four*" or "*Begin.*"

As for para. 4, above, but each movement performed quickly.

C.F.—As for para. 4, above (especially not fully stretching the legs).

Heels raising and Knees bending quickly with Arms stretching upward. "One" or "Begin."

Hl. r. and A. b.

"Two."

K. b. and A. upw. str.

"Three."

K. str. and A. b.

"Four."

Hl. lower and A. downw. str.

C.F.—As for para. 4, above, and Sec. 35, 10.

7. (H. f., etc.) **Heels raising and Knees full bending** (Plate 5, Fig. 12, d.). "One"—"Two"—"Three"—"Four" or "Begin."

As for para. 4, above, but knees bent as much as possible.

C.F.—As for para. 4, above.

Has increased effect on the muscles and flexibility of the ankle, knee, and hip joints.

Can also be performed quickly when a still stronger effect is required.

Note.—The following movements can also be performed in the Knee full bend position :—

Head turning quickly or Arms stretching sideways and Jumping forward, sideways, and backwards.

Heels raising and Knees full bending, with Arms raising sideways and upward. "One" or "Begin."

Hl. r. and A. sidew. r.

"Two."

K. full b. and A. upw. r.

"Three."

K. str. and A. sidew. lower.

"Four."

Hl. lower and A. downw. lower.

C.F.—As above, and Sec. 35, 21.

8. (H. f. etc.) **Feet astride—Place (a).** "One" or "Place."

Carry the left foot one foot-length to the left.

"Two."

Carry the right foot one foot-length to the right.



(a)

C.F.—(1) Swaying the body. (2) Altering the foot-angle.

The body in the final position must be evenly balanced on both feet.

Used as a starting position for many exercises, especially when combined with a double movement of the arms, e.g. *F. astr. A. upw. str.*

Feet together—Place. “One” or “Place.”

Carry the left foot back to its original position.

“Two.”

Close the right foot to the left.

C.F.—As above.

9. **Feet astride with Arms stretching upward (sideways) ; or Feet astride Arms upward (sideways) — Stretch.** “One” or “Stretch.”

As for para. 8, above and A. b.

“Two.”

As for para. 8, above and A. upw. (sidew.) str.

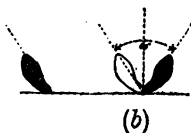
C.F.—As for para. 8, above.

10. (H. f. etc.) **Left Foot sideways—Place (b).** (Plate 5, Fig. 13, a to c.) “One” or “Place.”

Keeping the knees straight, carry the left foot two foot-lengths to the left and place the toe on the ground, distributing the weight of the body evenly, and keeping the heel well raised.

“Two.”

Sink on the heel.



C.F.—(1) Not taking sufficient distance. (2) Bending the knees. (3) Not carrying the body with the foot. (4) Lifting the toe too high and outward.

All *Foot placings* are taken as *Easy Leg* exercises for the purpose of giving control of the limbs.

The positions are also used as starting positions for many exercises. Fault (4) can be cured by practising the first movement of “*Foot inward—Place*” by itself and allowing the recruit to watch his foot.

Foot inward—Place. “One” or “Place.”

Without bending the knee, by raising the heel sharply and stretching the instep, lift the left foot off the ground, carrying the weight of the body on to the other foot without swaying, and, after a *momentary* pause, with the toe well pointed and

poised about one in. immediately above the spot where it rested.

"Two."

Bring the left foot sharply back to its original position without undue noise.

11. (H. f. etc.) **Foot placing sideways.** "One" or "Begin."

"One" and "Two."

Left F. sidew. pl., as in para. 10, above.

"Three."

Pause.

"Four" and "Five."

Left F. inw. pl., as in para. 10, above.

"Six."

Pause.

"One" or "Begin."

Repeat with right foot.

C.F.—As for para. 10, above.

The Metronome set at 112 gives the cadence.

12. (A. b.) **Foot placing sideways with Arms stretching sideways (upward).** "One" or "Begin."

As for para. 11, above, and Sec. 35, 8 and 10. The arm movements finishing at the same moment as "One" and "Five" of para. 11, above.

C.F.—As for para. 10, above.

This is a combination of a comparatively slow movement of the legs with a quick movement of the arms. The arms should not therefore be moved at the commencement of the leg movement, but both movements should be completed at the same time, *i.e.* as toe reaches ground and as heels come together. As an advanced exercise the arms may be stretched with "One" and "Four," bent with "Two" and "Five." The exercise has therefore an excellent effect on the nervous system.

13. (H. f.) **Foot placing sideways and Heels raising.** (Plate 5, Fig. 13.) "One" or "Begin."

"One"—"Two."

As in F. pl. sidew., para. 11, above.

"Three."

Hl. r.

"Four."

Hl. lower.

"Five"—"Six."

As in "Four" and "Five." F. pl. sidew.

"Seven."

Pause.

"One" or "Begin."

Repeat with right foot.

C.F.—As for para. 10, above, and (5) Not raising the heels sufficiently.

14. (H. f.) **Foot placing sideways and Heels raising and Knees bending.** (Plate 5, Fig. 14.) "One"—"Two"—"Three"—"Four"—"Five"—"Six"—"Seven"—"Eight"—"Nine" or "Begin."

Similarly to para. 13, above, adding two movements for the additional "*Knees bending*."

C.F.—As for para. 10, above. (Especially lowering the heels when bending the knees.)

Has stretching effect on the adductor muscles of the thigh.

Note.—The word "*Stretching*" as used here and hereafter in a similar connection means that the muscles are stretched normally and *not* that they are strained beyond their normal limit.

15. (H. f., F. full o.) **Left Foot outward—Place.** "One" or "Place."

Slightly bending the knee, carry the left foot two foot-lengths outward in the direction in which the toe is pointing, and place the toe on the ground, keeping the heel raised as high as possible with the knee straight and distributing the weight of the body evenly.

"Two."

Sink on the heel.

C.F.—(1) Keeping the knee stiff. (2) Not carrying the body with the foot.

Foot inward—Place. "One."

Keeping the knee straight, push off the ground with the outward foot without swaying the body and after a *momentary* pause.

"Two."

Bring the foot sharply back to its original position.

C.F.—(1) Bending the rear knee. (2) Swaying the body.

16. (H. f., F. full o.) **Foot placing outward.** "One"—"Two"—"Three"—"Four"—"Five"—"Six" or "Begin."

Similarly to F. pl. sidew. (para. 10, above).

C.F.—As for para. 10, above.

17. (H. f.) **Left Foot forward—Place.** "One" or "Place."

Slightly bending the knee, carry the left foot two foot-lengths straight to the front, without altering the foot-angle, distributing the weight of the body evenly.

"Two."

Sink on the heel.

C.F.—As for para. 15, above, and (3) Foot placed too much outward. (4) Foot placed not far enough to the front.

Foot inward—Place. "One."

Keeping the knee straight, push off the ground with the forward foot without swaying the body, and after a *momentary* pause—

"Two."

Carry the foot back to its original position.

C.F.—As for para. 15, above.

18. **Foot placing forward.** "One"—"Two"—"Three"—"Four"—"Five"—"Six" or "Begin."

Similarly to *F. pl. sidew.* (para. 10, above.)

C.F.—As for para. 10, above.

Note.—When *F. pl. outw.* or *F. pl. forw.* is used as a starting pos., the position of the feet may be changed (in two movements) on the word **Feet—Change.**

19. (H. f., F. full o.) **Left Foot outward—Lunge.** (Plate 6, Fig. 15.) "*Lunge.*"

Keeping the right foot flat on the ground and the right leg straight, incline the body and lunge outward, with the left leg three foot-lengths in the direction in which the toe is pointing, left knee bent over the instep and the trunk in line with the right leg, the body and head maintaining the same relative position as at *Attention.*

C.F.—Lunge too short and in a bad direction. (2) Front knee not bent enough. (3) Rear foot not flat on the ground.

(4) Rear leg bent. (5) Trunk not in line with the rear leg.

(6) Trunk turned.

Lunging is a fairly strong leg exercise, bringing a large number of muscles into play, especially the extensors of the leg.

Outward lunging is also used as a *Lateral* exercise, and is therefore again referred to under that group heading (Sec. 38).

Foot inward—Place. "*Place.*"

Keeping the right leg straight, press sharply from the ground with the left foot and resume the starting position for the Lunge.

C.F.—(1) Bending the rear leg. (2) Swaying the body.

20. (H. f., F. full o.) **Lunging outward.** "One," or "Begin."

Left F. outw. lunge.

"Two."

F. inw. pl.

"Three."

Right F. outw. lunge.

"Four."

F. inw. pl.

C.F.—As for para. 19, above.

21. (H. f., F. full o.) **Left Foot forward—Lunge.** "*Lunge.*"

Lunge forward in the same manner as described in lunging outward, but keeping the same foot-angle with both feet as in the starting position.

C.F.—As for para. 19, above, and (7) Altering the foot angle.

Also used as a *Dorsal* exercise and is therefore again referred to under that group heading (Sec. 41).

Foot inward—Place. "*Place.*"

Recover to the starting position in the same way as from the outward lunge.

C.F.—As for para. 19, above.

22. (H. f., F. full o.) **Lunging forward.** "*One,*" or "*Begin.*"

Left F. forw. lunge.

"Two."

F. inw. pl.

"Three."

Right F. forw. lunge.

"Four."

F. inw. pl.

C.F.—As for para. 19, above.

23. (H. f., F. full o.) **Left Foot backward—Lunge.** "*Lunge.*"

Take the position of forward lunge by carrying the left foot three foot-lengths backward and bending the right knee.

Left Foot inward—Place. "*Place.*"

Recover to the starting position by bringing the left foot forward.

Note.—In all Lunging exercises the position of the feet may be changed (in two movements) on the word **Feet—Change.**

24. (Attention, H. f.) **Jump to Feet astride.** "*Place.*"

With a slight spring carry off both feet so that they will be two foot lengths apart, at the same time bring the hands to the "*Hips firm*" position.

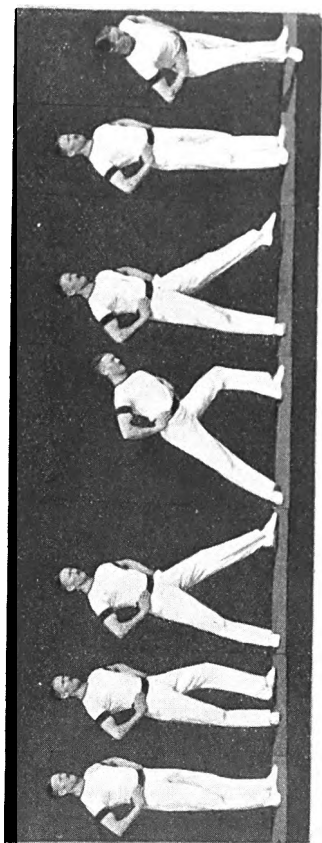
C.F.—(1) Jumping too wide. (2) Not springing from the toes.

Used as a starting position for exercises in the *Introductory* and *General* parts of the table.

25. (H. f.) **Astride jumping.** (Plate 6, Fig. 16.) "*Begin.*"
 Jump with the feet alternately apart (sideways) and together, remaining on the toes the whole time and slightly bending the knees. Separate the feet two foot-lengths apart each time. Cadence 130 to the minute.
 C.F.—(1) Bending the knees too much. (2) Not remaining on the toes. (3) Separating the feet too wide.
 Can be done with arm movements such as :
"Arms raised sideways, Astride jumping—Begin."
 Can also alter the number of jumps when the feet are together or astride.
26. (H. f.) **Hop with Toe placing sideways (or forward).** (Plate 7, Fig. 17.) "*Begin.*"
 Hop on alternate feet, slightly bending the knee, at the same time straightening the opposite leg and reaching with the toe as far to the side (or forward) as possible. Cadence 96 to the minute.
 C.F.—(1) Not reaching out far enough with the opposite foot. (2) Not hopping on the same spot. (3) Not keeping the body erect.
 Can be done as a combined exercise :—
"Hopping with toe placing sideways and forward" beginning either way, and with turning.
27. (H. f.) **Hopping with Leg raising sideways.** (Plate 7, Fig. 18.) "*Begin.*"
 Keeping the body as erect and steady as possible, hop upward on the toes of the right foot, springing from the knee and ankle joints and at the same time raising the left leg sideways, lowering it again and then hopping on the left foot and raising the right leg sideways, and so on alternately on each foot. Cadence 130 to the minute.
 C.F.—(1) Swaying the body. (2) The movements not being easy and light.
 This exercise can be done with *opposite* arm movements :
"With opposite arm raising to flight."
28. **High Kicking (at Hand.)** "*Begin.*"
 Keeping both legs braced, kick in the air as high as possible. Endeavour to kick the palm of the left (right) hand with the right (left) foot.
 C.F.—Not keeping the legs braced.
 To be taken free and later on the move.
Note.—Very useful exercise for *Hurdling* and *High jumping*, as it lengthens the hamstrings and increases the flexibility of the thigh.

PLATE 6.

L. Ex.



a.

b.

c.

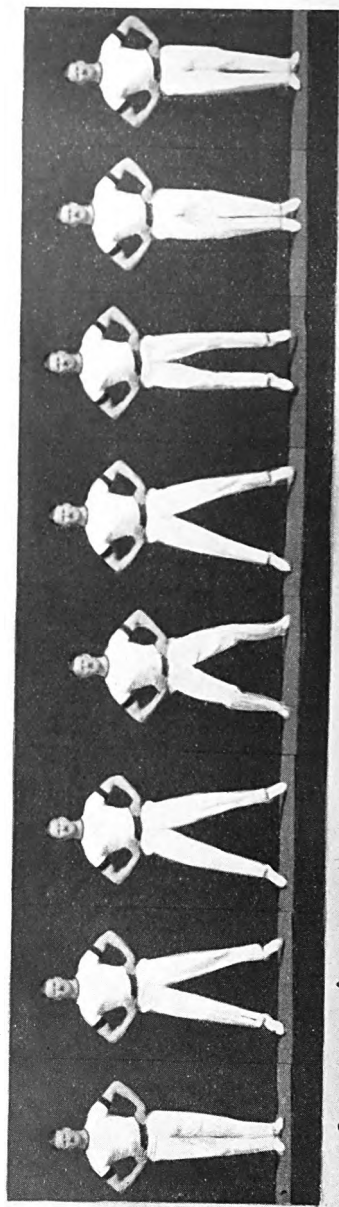
d.

e.

f.

g.

Fig. 15



a.

b.

c.

d.

e.

f.

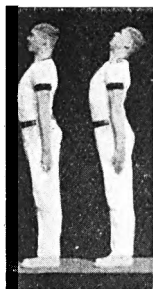
g.

h.

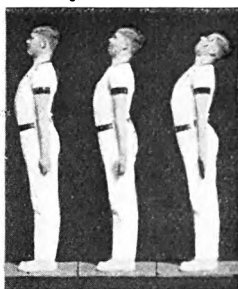
Fig. 16

PLATE 8.

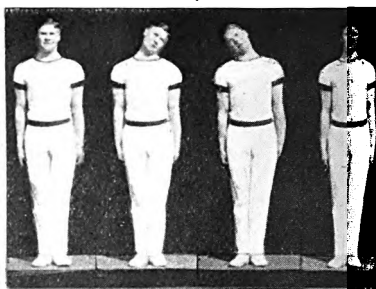
N. Ex.



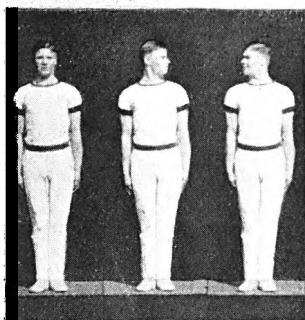
a. b.
Fig. 19.



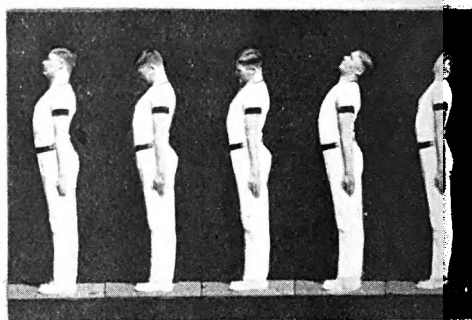
a. b. c.
Fig. 20



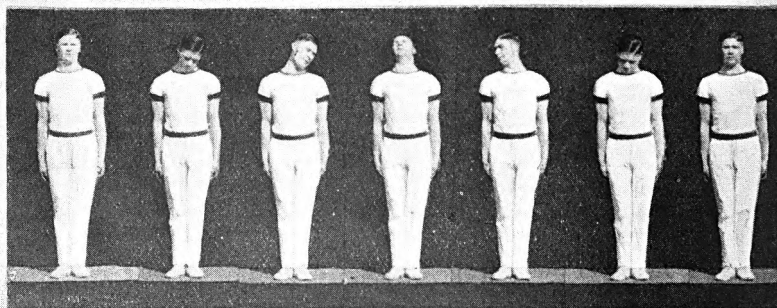
a. b. c. d.
Fig. 21.



a. b. c.
Fig. 22.



a. b. c. d. e.
Fig. 23. (Side)



a. b. c. d. e. f. g.
Fig. 23. Cont'd.

34. NECK EXERCISES

1. Although the exercises in this group are few and simple, they are very important, and should not be neglected. Their objects and effects are as follows :

They develop the mobility and strength of the neck, and improve the carriage of the head and chest.

To obtain the full effect of these otherwise simple exercises the muscles employed should be contracted to their fullest extent without restricting the breathing, and the arms and fingers fully extended downwards.

They are found generally in the final group of exercises in the tables, but some may be inserted in other places, if the carriage of the students is getting slack.

2. **With Fingers stretching, Head bending backward, also with Hands turning outwards.** (Plate 8, Figs. 19 and 20.)
“*One.*”

Without altering the position of the trunk bend the head slowly backward, stretching the fingers, and the chin drawn in.

“*Two.*”

Raise the head slowly to its former position, at the same time relaxing the fingers.

C.F.—(1) Chin not drawn in. (2) Shoulders raised. (3) Back hollowed. (4) Breathing restricted.

Used for correcting the position of the head. See para. 7, below, and Sec. 46.

3. **Head bending backward with Head turning.**

As for para. 2, above, at the same time turning the head sideways.

C.F.—As for para. 2, above.

4. **With Fingers stretching, Head bending forward.** “*One.*”
Stretching the neck upward, draw in the chin, bend the head slightly forward and stretch the fingers.

“*Two.*”

Raise the head slowly to its former position at the same time relaxing the fingers.

C.F.—Dropping the head forward on to the chest.

This exercise should not be taken too soon, and is not as a rule necessary to use very frequently.

5. **With Fingers stretching, Head bending sideways.** (Plate 8, Fig. 21.) “*One.*”

Bend the head slowly but strongly to the left, keeping it well back during the movement, the face turned to the front, and the fingers stretched.

"Two."

Raise the head slowly to its former position, relaxing the fingers.

"Three."

Bend the head as above described but to the right.

"Four."

Raise the head slowly to its former position.

C.F.—(1) Head dropped forward. (2) Shoulder raised.

Has stretching effect on the side muscles of the neck.

6. With Fingers stretching, Head turning. (Plate 8, Fig. 22.)
"One."

Turn the head slowly but strongly to the left as far as possible, at the same time stretching the fingers.

"Two."

Turn the head slowly to its former position and relax the fingers.

"Three."

Turn the head as described above, but to the right.

"Four."

Turn the head slowly to its former position.

C.F.—(1) Head not kept erect. (2) Shoulders not kept steady.

With Fingers stretching, Head turning quickly. "One"—
"Two"—"Three"—"Four."

As described above, but performing each movement quickly.

7. With Fingers stretching, Head rolling. (Plate 8, Fig. 23.)
"Begin."

Bend the head forward and commence by rolling the head to pass through the positions of "*Head sideways and backwards—bend.*" The fingers will remain stretched throughout.

C.F.—Restricting the breathing.

"*Head bending backward*" should be given as a *corrective* after this exercise, para. 2, above.

8. With Fingers stretching, Head turning from side to side.
"Begin."

As in "*Head turning*," para. 6, above, but the movements are done slowly and smoothly from side to side.

C.F.—As for para. 6, above.

9. With Fingers stretching, Head bending from side to side.
"Begin."

As in "*Head bending sideways*," para. 5, above, but the movements are continuous with a smooth rhythm.

C.F.—As for para. 5, above.

35. ARM EXERCISES

1. The following are the objects and effects of the simple and comparatively easy movements of the arms which are included in this group of exercises.

They provide starting positions for various *Trunk* exercises, develop the mobility of the shoulder blades and joints of the arm, improve the carriage of the upper part of the trunk, and at the same time strengthen the arms for harder work.

The Arm exercises are sub-divided as follows :

- Group i. Hips firm, Neck rest, etc. Paras. 2 to 7, below.
- „ ii. Arm stretchings. Paras. 8 to 16, below.
- „ iii. Arm raisings. Paras. 17 to 23, below.
- „ iv. Arm swingings and flinging. Paras. 24 to 31, below.

These sub-groups are employed in the following manner in the daily lesson (*i.e.* in a Table of exercises)—*Arm stretchings* and *Arm swingings*, being of an energetic nature, are used principally as “*Introductory Exercises*” on account of their stimulating effect on the circulation and respiration, while the *Arm raisings* are used as more moderate movements in the “*Final Exercises*.”

The Arm exercises are also used in conjunction with other exercises to increase the effect of the latter.

2. **Hips—Firm.** (Plate 9, Fig. 24.) “*Firm.*”

Raise the hands quickly and grasp the waist firmly just above the hips, fingers together in front and thumbs behind, palms pressed well down, shoulders kept in the same position as at *Attention*.

C.F.—(1) Hands carried wide of the body during the movement. (2) Heel of the hand away from the side. (3) Hands too far back. (4) Elbows pressed back. (5) Shoulders raised.

Used as a starting position for a large number of exercises.

Besides being convenient for the purpose of getting the arms out of the way of the legs, etc., in performing certain *Trunk* and *Leg* exercises, the position of “*Hips firm*” has the advantage of transferring the weight of the arms from the shoulders and upper part of the trunk to the hips, this giving rather more freedom to the chest walls. In addition, it has the effect of bracing the whole trunk for the various exercises with which it is employed.

Hands—Down. “*Down.*”

Lower the arms sharply to the sides the shortest way.

C.F.—(1) Hands not carried close to the sides. (2) Backs of hands turned forward.

3. Neck—Rest. (Plate 9, Fig. 25.) “Rest.”

Raise the hands quickly the shortest way and place them behind the upper part of the neck, fingers stretched, and tips just meeting, chest well raised, head erect and elbows pressed well back.

C.F.—(1) Head pushed forward. (2) Elbows not pressed back enough.

Used as a starting position for many exercises.

Owing to the difficulty of maintaining the position correctly it should not be used too early.

Hands—Down. “Down.”

Lower the arms sharply to the sides the shortest way.

4. Hands on Head. “Ready.”

As for para. 3 above, but the fingers rest on the top of the head. Used as a starting position for *Lateral* exercises (Sec. 38).

C.F.—(1) Hands holding the top of the head. (2) Fingers interlaced.

5. Arms—Bend. (Plate 9, Fig. 26.) “Bend.”

Moving the elbows as little as possible from the sides, bend the arms quickly and energetically by carrying the hands the shortest way close up in front of the body till the forearms are fully bent on the upper arms, fists clenched and carried backward into line with the shoulders, the position of which should be maintained as at *Attention*, backs of the hands turned outward.

C.F.—(1) Hands raised sideways in bending the forearms. (2) Elbows forced backwards and points of the shoulders forward. (3) Elbows too far from the body and not kept down. (4) Head poked forward. (5) Small of the back hollowed. (6) Finger nails turned forward.

Used as the starting position for all *Arm stretchings* and many other exercises. As it is therefore used very frequently its correct performance is of the utmost importance. Care should be taken that the breathing is in no way restricted by forcing the elbows too close to the sides.

(Arms) downward—Stretch. “Stretch.”

Stretch the arms sharply downward to the sides.

Note.—**Hips firm, Neck rest and Arms bend** may be taken from any position of the arms.

6. (F. astr.) “S” position. (Plate 6, Fig. 27.) “Position.”

One hand assumes the “*Hips firm*” position and the other goes to a raised position over the head, with palm of hand downward, arm being slightly bent in a graceful curve.

C.F.—Stiffness of wrist and elbow of the raised arm.

7. Arms low cross. (Plate 9, Fig. 28.) "*Ready.*"

The arms are placed across the lower part of the body, crossing each other at the wrists, elbows slightly bent.

C.F.—(1) Arms not crossing each other. (2) Elbows bent too much.

Used as a starting position in many exercises.

8. (A. b.) Arms sideways—Stretch. (Plate 9, Fig. 29.) "*Stretch.*"

Stretch the arms sharply sideways in line with the shoulders, palms of the hand downward, fingers closed and fully extended.

C.F.—(1) Hands not carried the shortest way. (2) Hands lowered or not carried sufficiently back. (3) Shoulders raised. (4) Back hollowed.

In addition to its use as an *Arm* exercise the position is often taken as a starting position for other exercises.

9. (A. b.) Arms stretching sideways. "*One*" or "*Begin.*"

A. sidew. str.

"*Two.*"

A. b.

C.F.—As for para. 8, above.

10. (A. b.) Arms upward — Stretch. (Plate 9, Fig. 30.) "*Stretch.*"

Stretch the arms sharply upward to their fullest extent, hands the width of the shoulders apart, palms inward, fingers closed and fully extended.

C.F.—(1) Hands not in line with the arms. (2) Palms not fully turned inward. (3) Fingers not fully stretched. (4) Arms not fully stretched. (5) Arms not far enough back. (6) Head poked forward and back hollowed.

Owing to the attachment of the pectoral muscles to the humerus the ribs are raised considerably in the performance of this exercise.

Also used as a starting position for many exercises so as to increase their effect.

The correct taking of this position under all circumstances is a useful guide as to proficiency and progress.

11. (A. b.) Arms stretching upward. "*One*" or "*Begin.*"

A. upw. str.

"*Two.*"

A. b.

C.F.—As for para. 10, above.

12. (A. b.) **Arms forward — Stretch.** (Plate 9, Fig. 31.)
"Stretch."

Stretch the arms sharply forward in line with the shoulders, palms of the hands inwards, fingers closed and fully extended, shoulders kept well back.

C.F.—(1) Allowing the shoulders to go forward. (2) Rounding the back.

This exercise is difficult to perform correctly, and should not, therefore, be employed too early.

13. (A. b.) **Arms stretching forward.** *"One"* or *"Begin."*
 A. forw. str.
"Two."
 A. b.

C.F.—As for para. 12, above.

14. (Attention.) **Arms forward raise.** *"Raise."*

Raise the arms to the *"Arms forward stretch"* position, keeping them stretched and parallel throughout the movement.

C.F.—As for para. 12, above.

15. (A. b.) **Left Arm upward, right Arm downward—Stretch.**
"Stretch."

Stretch the arms sharply as directed.

Used as a starting position for some *Lateral* exercises.

C.F.—(1) Trunk not kept upright. (2) Head bent towards upward arm.

Arms—Change. *"Change."*

Come to the *"Arms bend"* position and stretch them in opposite directions.

C.F.—As above.

Note.—**Arms stretching sideways, upward or forward** may be combined as required, and can also be done with clenched fists.

16. (A. b.) **Arms bending and stretching (slowly),** various directions, also with fists clenched. *"Begin."*

A. b. and str. as for paras. 5 and 8, above, and in the named directions, the movements to be done smoothly with a full stretching effect.

C.F.—As for paras. 5 and 8, above, and Jerky movements.

17. **Arms sideways—Raise.** *"Raise."*

Raise the arms steadily sideways in line with the shoulders, palms of the hands downward, fingers closed and fully extended.

C.F.—(1) Shoulders raised. (2) Hands not carried sufficiently back.

See Sec. 46 with regard to the employment of *Arms raising* as a *Corrective Exercise*.

Arms—Lower. “*Lower.*”

Lower the arms steadily to the sides.

18. Arms raising sideways. “*One*” or “*Begin.*”

A. sidew. r.

“*Two.*”

A. downw. lower.

C.F.—As for para. 17, above.

19. (F. astr. one Hand H. f.) Arm circling. (Plate 10, Fig. 34.)
“*Begin.*”

Jump to *Astride* position, placing right hand hips firm, slightly turn the body to the left, circle the left arm forward, upward and backward in a free and easy movement.

“*Change.*”

Slightly turn to right and circle right arm, at the same time change the left hand to hips firm.

C.F.—(1) Jerky movements. (2) Arm not making a complete circle over the shoulder. (3) Body inclined too much.

(A. sidew. r. Hands turn.) **Arms circling.** “*Begin.*”

Rotate the arms, keeping them stretched sideways, with an upward and backward movement.

C.F.—Allowing the arms to come too far forward.

The circle should be gradually increased.

20. (A. forw. r.) Arms parting. “*Part*” or “*Begin.*”

Keeping the palms of the hands in the same plane, part the arms vigorously sideways and backward to their fullest extent, immediately returning to the starting position.

C.F.—(1) No rebound. (2) Arms not kept in line with the shoulder. (3) Head jerked forward.

Arms parting with Palms of Hands turning upward.
“*Part*” or “*Begin.*”

As above, and turn the palms of the hand upward.

21. Arms raising sideways upward, and downward. “*One*”
or “*Begin.*”

A. sidew. r.

“*Two.*”

Turn the palms of the hands upward and immediately raise the arms to the *A. upw. str. pos.*

"Three."

Lower the arms sideways to the level of the shoulders, keeping them well back and the palms of the hands turned upward.

"Four."

Turn the palms downward and immediately lower the arms to the sides.

C.F.—Arms not kept far enough back during the movements.

22. Arms sideways and upward—Raise. *"One"* or *"Begin."*

By a continuous movement raise the arms sideways and upward as in para. 21, above, turning the hands steadily while the arms are passing the level of the shoulders.

C.F.—As for para. 21, above.

Arms Lower. *"Two."*

Lower the arms to the sides by reversing the above movement.

23. Arms raising forward, upward, sideways and downward.

"One" or *"Begin."*

Keeping the arms the width of the shoulders apart, raise them forward and continue the movement to the *A. upw. str. pos.*

"Two."

Lower the arms sideways and downward.

C.F.—The full *A. upw. str. pos.* not taken before the arms are lowered when performed judging the time.

24. Arms swinging upward. *"One."*

Swing the arms quickly, keeping them well stretched, forward and upward to the *A. upw. str. pos.*

Arms swinging downward. *"Two."*

Swing the arms quickly forward and downward to the sides.

C.F.—(1) Trunk thrown backward. (2) Arms bent during the swing.

Has a very strong stretching effect on the pectoral muscles.

25. (A. sidew. str.) Arms swinging forward and upward.

"Begin."

Keeping the arms stretched, swing them to the first position of arms parting and continue with an upward movement into the *Arms upward stretch* position, the movement to be continuous. Reverse the movement.

C.F.—(1) Head poked forward. (2) Trunk thrown back.

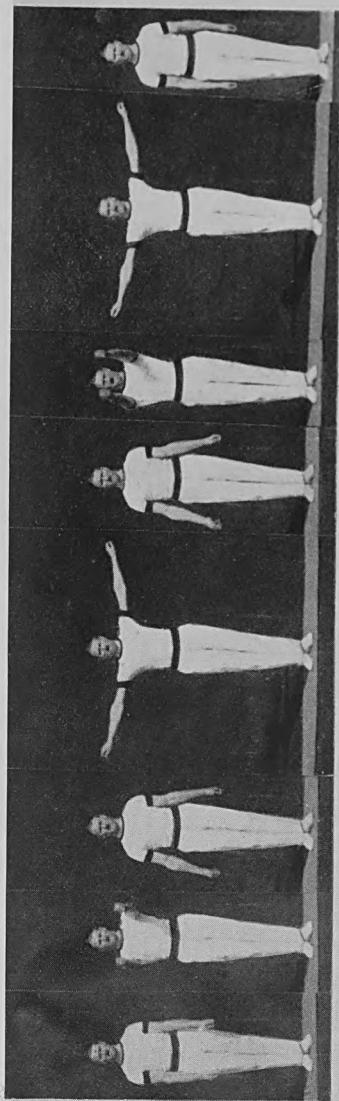
26. (A. upw. str.) Arms swinging downward and backward.

"One."

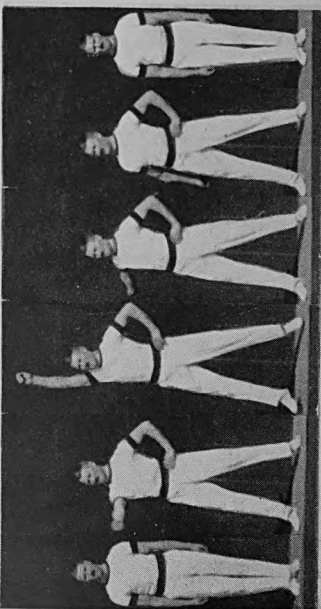
As for *A. swg. downw.*; para. 24, above, but continued backward as far as possible.

PLATE 10.

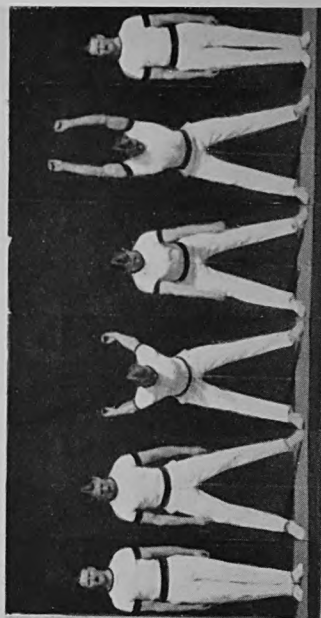
A. Ex.



a. b. c. d. e. f. g. h.
Fig. 33.



a. b. c. d. e. f.
Fig. 34



a. b. c. d. e. f.
Fig. 35.

"Two."

Swing the arms to the *A. upw. str. pos.*

C.F.—Shoulders and trunk allowed to go forward.

27. (F. astr. Tr. forw. bend.) **Arms swinging backward, forward, and upward.** (Plate 10, Fig. 35.) "*Begin.*"

Swing the arms backward, forward, and upward, to the fullest extent with a free and easy swing, allowing them to rebound to the starting position. A good swinging rhythm should be maintained.

C.F.—(1) Body coming up with the arms. (2) No rebound of the arms. (3) Arms too stiff.

A good exercise for loosening the shoulder joints.

28. (Attention.) **Arms forward—Bend.** (Plate 9, Fig. 32.) "*Bend.*"

Raise the arms quickly, keeping the elbows well back, bend the forearms sharply forward and inward as much as possible.

Used as the starting position for *Arms flinging*, para. 29, below.

C.F.—(1) Allowing the elbows to move forward and the hands to come too close together. (2) Back too much hollowed.

Arms downward—Stretch. "*Stretch.*"

Stretch the arms sharply downward to the sides.

29. (A. forw. b.) **Arms flinging.** "*Fling*" or "*Begin.*"

Without allowing the elbows to come forward, fling the arms vigorously sideways and backward to their fullest extent, keeping the palms of the hands downward, and immediately return to the position of *A. forw. b.*

Or "*Begin.*"

Perform the *A. fling.* movement until ordered to stop, observing short pauses in the forw. pos.

C.F.—(1) Head poked forward. (2) Flinging not horizontal. (3) Hands brought too close together in the recovery. (4) Hitting the chest with the hands. (5) Stretching the hands forward after the "*Fling.*"

Has a strong stretching effect on the pectoral muscles. To be performed judging the time.

30. (Attention.) **Small Arm swings.** (Plate 10, Fig. 33.) "*Begin.*"

The arms are swung to the "*Arms forward raise*" position, down to the side, and up to the "*Sideways stretch*" position,

in a free and easy movement. Thumbs to the front, fingers slightly bent.

C.F.—(1) Jerky movements. (2) Arms brought too high in the forward or sideways position. (3) Arms not being swung down to the side.

31. (Attention.) **Small and large Arm swings.** "*Begin.*"

As for para. 30, above, but on swinging forward the second time, the arms are carried on to complete the circle backwards, passing through the "*Forward and upward stretch*" position.

C.F.—As for para. 30, above, and (4) Head coming forward during the large circling of the arms.

36. CO-ORDINATING EXERCISES

1. The exercises in this group are those which exercise so many muscle groups that they cannot be classified under any special heading.

They are more for the co-ordination of movements between the arms and legs than for strengthening purposes, and their value as such is lost as soon as they become a *reflex* action. When they are becoming a reflex action the instructor should make some small change, such as altering the number of jumps when the feet are together, or changing the direction of arms stretching, etc., so that the *mental* effort is still retained.

They are chiefly found in the introductory part of the table because they have free and easy rhythmical movements and can be worked one after the other without a stop, thereby warming up the whole of the body before the more strenuous parts of the general table.

2. (F. astr. A. l. c.) **Arms fling from low cross to sideways stretch.** (Plate 11, Fig. 36.) "*Begin.*"

Fling the arms outward with a swinging movement so that they come to the *Sideways stretch* position, at the same time forcing them back to their utmost limit and rebound to the starting position.

C.F.—(1) Not forcing the arms backward. (2) Jerking the body and head forward. (3) Arms not in line with the shoulders.

This exercise has a good stretching effect on the pectorals and intercostals.

3. (A. l. c.) **Heels raising with Arms flinging to flight.** (Plate 12, Fig. 38.) "*Begin.*"

Fling the arms upward, outwards and backward to the *Flight* position (palms to the front) to their utmost limit, at the same

time raising the heels and fully stretching the body, then allow the arms to quickly rebound to the starting position and the heels to sink to the ground.

C.F.—(1) Allowing the body to come forward. (2) No effort in the backward movement of the fling. (3) Not checking the heels as they come to the ground.

A good exercise for the shoulder girdle, and remedying round shoulders.

4. (F. astr.) **Trunk twisting with alternate Arm flinging.**
“*Begin.*”

As for “*Trunk twist*” and “*Single Arm flinging*” (sec. 38, 14), except the trunk is twisted from left to right and right to left with the alternate *Arm fling to flight*.

C.F.—(1) Not keeping the feet flat on the ground. (2) Not using the swing of the arms to help the trunk twist. (3) Body not erect.

Pupils should be encouraged to turn the head with the twist and see how far they can see behind them.

5. (Attention.) **Heels raising and Knees bending with Arms forward raising, forward bending, flinging and lowering.**
(Plate 11, Fig. 37.) “*Begin.*”

Raise on the toes, at the same time raise the arms in the *Forward raise* position (palms inward).

“*Two.*”

Bend the knees to the *Knees bend* position, at the same time bring the arms to the *Forward bend* position.

“*Three.*”

Stretch the legs and fling the arms to the *Sideways stretch* position.

“*Four.*”

Lower the heels to the ground, at the same time lower the arms to the side.

C.F.—(1) Body not erect. (2) No effort in the arms fling. (3) Allowing the arms to fall below the line of the shoulders during the fling.

This exercise has a good stretching effect on the chest and lengthens the pectoralis group of muscles.

6. (A. l. c.) **Heels raising and Knees bending with Arms flinging to flight.** (Plate 12, Fig. 39.) “*Begin.*”

Rise on the toes and fling the arms with a swinging movement to *Flight*, allowing them to rebound to the starting position. On the rebound of the arms, bend the knees to the *Knees bend* position, stretch the knees again, flinging the arms to *Flight*, and on their rebound to the *A. l. c.* position, lower the heels.

C.F.—As for para. 3 above. (4) Body not being kept upright.

7. (Attention.) **Small Arm swings with Feet placing sideways.** (Plate 13, Fig. 40.) "*Begin.*"

As for *Small arms swings*, Sec. 35, 30, but when the arms swing outward, carry off the left foot as for *F. sidew. pl.*; on the next outward swing of the arms, bring the left foot in as for *F. inward pl.* Repeat with the right foot.

C.F.—As for Sec. 35, 30, and (4) Not carrying the foot off two foot-lengths. (5) Not meeting the ground with toe stretched. (6) Not stretching foot when bringing it in.

The foot always moves with the outward swing.

8. (Attention.) **Heels raising and Knees bending with small and large Arm swings.** (Plate 14, Fig. 42.) "*Begin.*"

Swing the arms to the forward position and on the sideways swing, bend and stretch the knees and lower the heels. On the large arm swing repeat the movement.

This exercise should be done in a free and easy rhythmical movement, the leg movements should be slightly in front of the arm movements. This can also be done bending the knees fully.

C.F.—(1) Lack of rhythm. (2) Jerky movements.

9. (Attention.) **Small jumps with single Arm stretching (various directions.)** (Plate 13, Fig. 41.) "*Begin.*"

Spring lightly from the ankles and toes upward, at the same time bring the left arm to the *Arm bend* position (as the toes come to the ground). Bend the knees slightly forward and again rebound upward off the toes, this time stretching the arm in the required direction (the stretch being finished as the toes come to the ground). Continue the movements until the command "*Halt*" or "*Change*" is given.

"*Change.*"

Repeat, using right arm.

Cadence 140 paces to a minute.

C.F.—(1) Not springing high enough. (2) Not remaining on the same spot. (3) Not bending and stretching the arms correctly or at the same time.

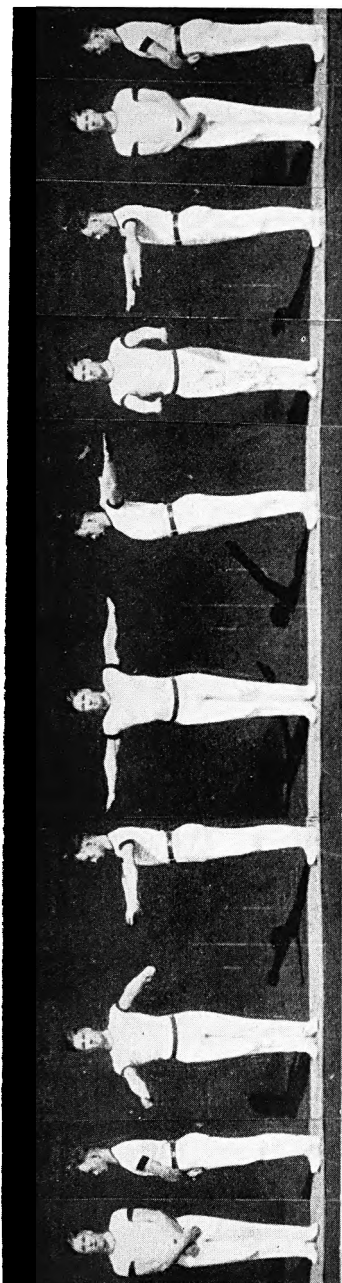
A good warming-up exercise. Best taught by getting the pupils to do the small jumps first without *Arms stretching*. Then add *Arms stretching forward, and downward, then forward, upward, and downward, then forward, upward, sideways, and downward*. When they have become accustomed to these movements, change the directions or sequence of stretching.

10. (Attention.) **Small jumps with alternate Arm stretching.** "*Begin.*"

As for para. 9, above, except a change is made after each arm

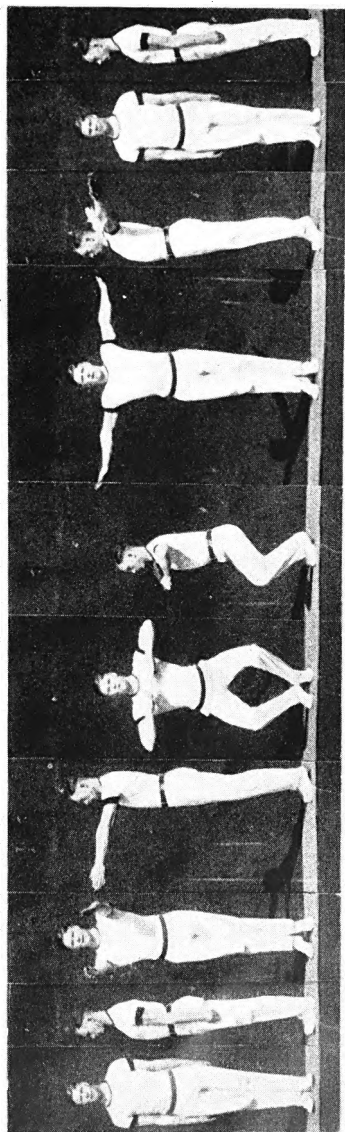
PLATE 11.

Co-ord. Ex.



a. *b.* *c.* *d.* *e.*

Fig. 36.

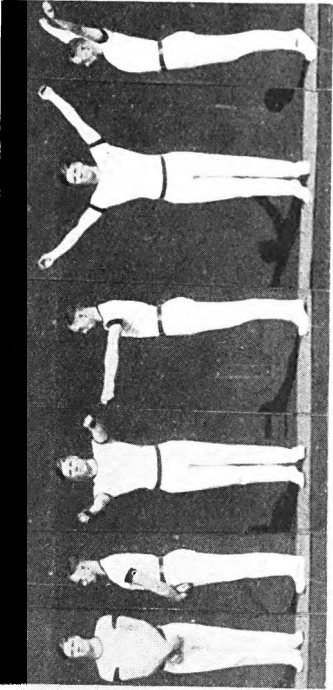


a. *b.* *c.* *d.* *e.*

Fig. 37.

PLATE 12.

Co-ord. Ex.

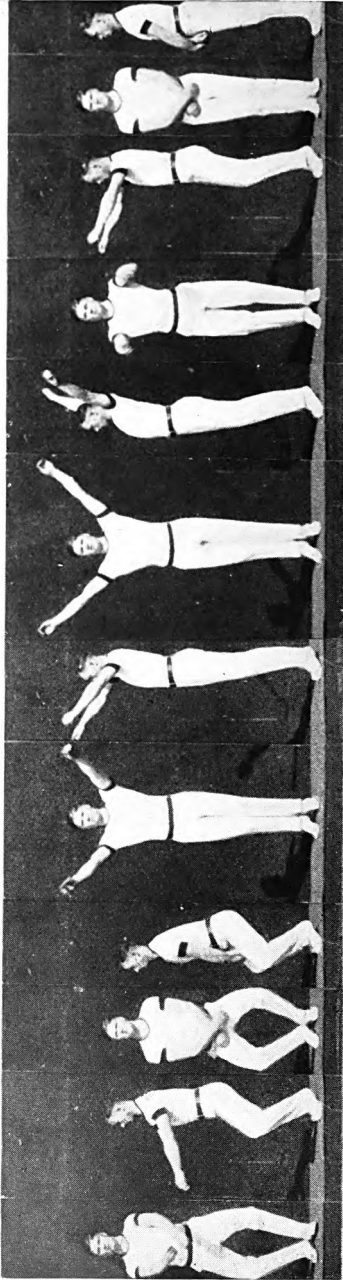


c.

b.

d.

Fig. 38



f.

e.

d.

c.

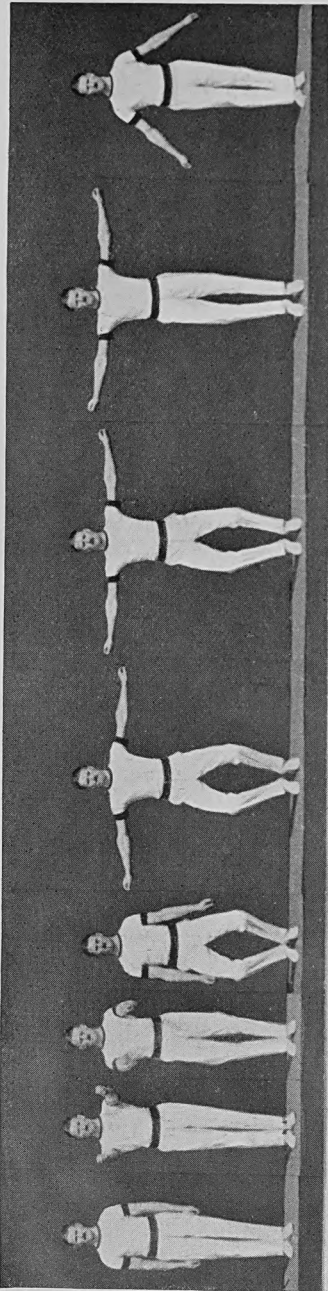
b.

a.

Fig. 39.

PLATE 14.

Co-ord. Ex.



h

g

f

e

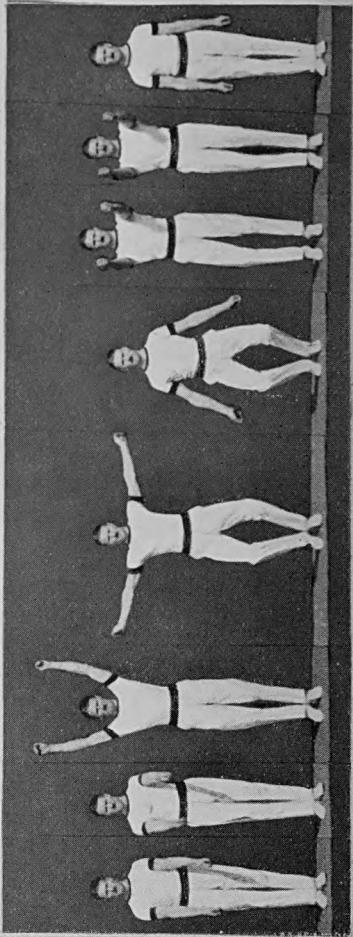
d

c

b

a.

Fig 42.



s.

r

q.

p.

o.

n.

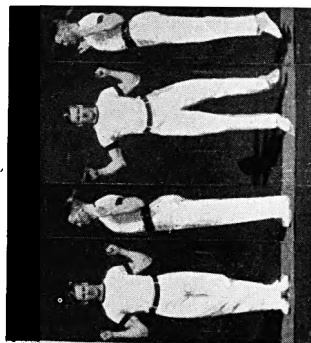
m.

k.

Fig 42 Contd.

PLATE 17.

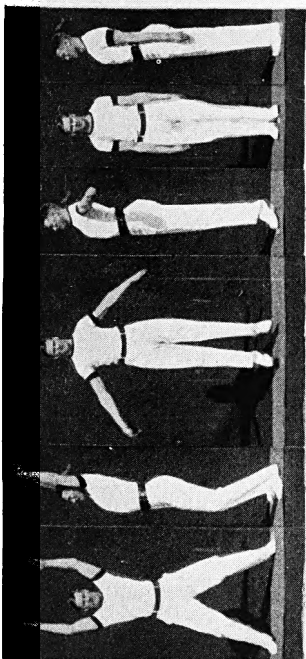
Co-ord. Ex.



b.

a.

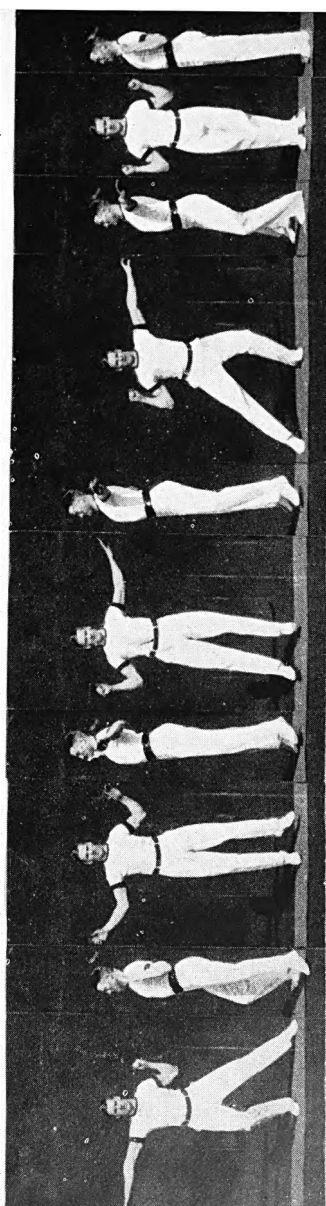
Fig. 46.



h.

g.

Fig. 45. (Contd from Plate 16.)



g.

f.

e.

d.

c.

Fig. 46 Contd.

has completed the stretching movements, forward, upward, sideways, downward, or whatever sequence has been given.

C.F.—As for para. 9, above.

(A. b.) **Small jumps with Arms stretching.** (Plate 15, Fig. 43.) "*Begin.*"

As above with both arms stretching in various directions.

C.F.—As for para. 9, above.

Can also be made more difficult by naming different directions for each arm.

11. (Attention.) **Astride jumping with Arms raising sideways.** (Plate 16, Fig. 44.) "*Begin.*"

Keeping on the ball of the feet jump astride and feet together alternately, at the same time raise the arms sideways to the *Sideways stretch* position, when the feet are astride, and lower them when the feet are together.

C.F.—(1) Too wide astride jump. (2) Bad co-ordination between arms and legs. (3) Arms not in line with the shoulders. (4) Arms allowed to fall to the side and beating the thigh.

This exercise can be done as a warming-up exercise when the hands are cold, the hands should then smack the side of the thigh, also one, two or more jumps can be added when the feet are together.

12. (Attention.) **Astride jumping with Hands clap above Head.** (Plates 16 and 17, Fig. 45.) "*Begin.*"

As for para. 11, above, but the arms move quickly and the hands are clapped above the head when the feet are in the astride position.

C.F.—As for para. 11, above, and (5) Arms not raised through the *sideways stretch* position. (6) Arms not straight above the head.

13. (Attention.) **Hopping with Leg raising sideways and opposite Arm raising to flight.** (Plate 18, Fig. 47.) "*Begin.*"

With the body carried erect, hop on the ball of the left foot, at the same time swing the right leg sideways as far and as high as it will go, raise the left arm to flight, palm of the hand downward. Bring the right leg in to the left and the right arm down to the side, hop on the left foot and raise the right arm.

C.F.—(1) Body leaning forward. (2) Not hopping on the same ground. (3) Raising the same leg and arm.

14. (Attention, A. b., etc.) **Hopping with Toe placing and opposite Arm stretching (various directions).** (Plate 17, Fig. 46.) "*Begin.*"

As for *Hopping with Toe placing sideways or forward* (Sec. 33, 26), and *Arms bending and stretching* (Sec. 35, 16). The *Arm stretch* position should be completed as the toe is placed sideways or forward, and the *Arms bend* position when the feet are together.

C.F.—As for Sec. 33, 26 and Sec. 35, 16, and (1) Stretching the same leg and arm. (2) Not completing the stretch of the arm or leg. (3) Bad rhythm.

15. (Attention, etc.) **Left (right) Leg swinging forward and backward, Hands clapping under Leg, above Head and behind Back.** (Plate 18, Fig. 48.) "*Begin.*"

Bring the left leg forward to the *Forward raise* position, clap the hands together under the raised leg, swing it down and backward and clap the hands together above the head, when the leg is in the *Backward raise* position. Bring the leg forward to the right and place it on the ground and clap the hands together behind the back.

Repeat with the right leg.

C.F.—(1) Bending the body forward when clapping the hands. (2) Bad rhythm and jerky movements above the head. (3) Lack of control.

This exercise should not be attempted until the balance exercise of *Leg raising forward, etc.* has been mastered.

16. (A. upw. str. Hands together.) **Breast stroke swimming with Heels raising and Knees full bending.** "*One.*"

Rise on the toes, lowering the arms to the *Flight* position, fingers stretched, palm outwards.

"*Two.*"

Allow the legs to relax to the *Knee full bend* position, with the arms bent and fingers touching together just under the chin.

"*Three.*"

Keeping on the toes, resume the starting position by straightening the arms above the head and stretching the legs, and lowering the heels.

C.F.—Bad co-ordination.

37. HEAVING EXERCISES

1. Heaving exercises are those which specially exercise the *heaving muscles*. These heaving muscles (situated for the most part on the upper part of the trunk) are the chief muscles of the shoulder girdle.

When the exercises are correctly performed they have a beneficial effect in developing the mobility of the thorax. On the other hand, if performed badly they merely develop certain muscles at the expense of the carriage of the body and of the mobility of the chest walls. Attempts to perform these Heaving exercises a large number of times very easily cause these injurious effects, with the possible addition of undue strain on the heart and lungs. Such practices must never be permitted, but correctness of position and style should be aimed at. Progression in these exercises should be very gradual, and it should be noted that as soon as it is found impossible to maintain the correct positions the limit of the usefulness of the exercise is passed.

The holding of the breath during these exercises, which is often a sign that the exercise is too strong for the pupil, should be specially guarded against.

Some of these exercises (*e.g.* rope climbing) are also of practical as well as of educational value.

The subdivision of this group is as follows :—

Group i. Hanging positions and Arms bending from hanging positions. Paras. 2 to 13, below.

„ ii. Travelling in hanging positions. Paras. 14 to 17, below.

„ iii. Climbing, Circling. Paras. 18 to 23, below.

„ iv. Shelf. Paras. 24 to 31, below.

2. (Short Arm's length from and facing beam (wall bars.)) **Beam (wall bar)—Grasp.** “*Grasp.*”

Keeping the body steady, grasp the beam quickly with the hands a little more than shoulder width apart.

Used as a starting position for many exercises. In the case of the wall bars the height to be grasped should be mentioned as a caution, and the full width to be used.

With undergrip, beam—Grasp. “*Grasp.*”

Take a short pace forward with the left (right) foot, at the same time pass the hands quickly underneath the beam and seize it with an undergrip with the hands rather more than the width of the shoulders apart, bending the trunk slightly forward if necessary.

Used as a starting position for several exercises.

Hands—Down. “*Down.*”

Drop the hands to the sides, resuming the position of *Attention*.

3. (Beam grasp.) **Fall hanging.** (Plate 19, Fig. 49.) “*One*” or “*Down.*”

Incline the body forward by bending the arms and raising the heels from the ground until the chest touches the beam, keeping the elbows well out.

"Two."

Swing the legs forward and place the heels on the ground, at the same time lower the body evenly to the full extent of the arms. In this position the body and legs should be well stretched, the heels resting on the ground, feet closed, toes slightly pointed without stiffness, the weight of the body supported from the beam by the arms, which should be straight and at right angles to the body.

C.F.—(1) Legs swung too far forward. (2) Sliding the feet along ground. (3) Heads poked forward. (4) Seat dropped. (5) Shoulders allowed to go forward.

Used as a starting position for several exercises.

Has an excellent effect on the muscles of the back and shoulder blades and a consequent corrective effect on the carriage.

On the Feet—Up. *"Up."*

By bending the arms and, if necessary, the knees, swing the feet backward under the beam and assume the *Beam grasp* position.

C.F.—(1) Sliding the feet along the ground.

4. (Fall hang.) **Arms—Bend.** (Plate 19, Fig. 49, f.) *"Bend."*

Maintaining the stretched position of the body, bend the arms as much as possible, keeping the elbows well back and out.

C.F.—(1) Turning the toes up. (2) Elbows allowed to go forward. (3) Head poked forward.

An easy *Heaving* exercise. It is a good preparation for stronger exercises of this group and employs the heaving muscles of the back instead of those of the chest. Progression is obtained by lowering the height of the beam.

Arms—Stretch. *"Stretch."*

Lower the body evenly to the *fall hang* position.

5. (Fall hang, or fall hang., A. b.) **Leg raising.** *"One."*

Raise the left leg as high as possible keeping it well stretched and the toe pointed.

"Two."

Lower the left leg evenly to the starting position.

"Three" and *"Four."*

Repeat with the right leg.

Introduces an oblique abdominal movement and increases the general effect of the exercise.

6. (Wall bar (beam) grasp.) **Arch hanging.** (Plate 20, Fig. 50.) *"One"* or *"Down."*

Stretch the left leg backward by bending the right knee and lowering the body with the arms straight so that the chest rests against the bars, toes bent forward and resting on the ground.

"Two."

Stretch the right leg backward and place it alongside the left. In this position the toes should be under the insteps and the feet at the usual foot angle.

C.F.—(1) Knees not straightened. (2) Heels separated. (3) Toes pointed backward instead of being well bent forward under the insteps.

Used as the starting position for *Arms bending*. Has a good stretching effect on the body. The dorsal portion of the spine should be arched as much and the lumbar portion as little as possible by the action of the abdominal muscles; the bar grasped should not therefore be too low.

On the Feet. "One" or "Up."

By bending the left knee bring the left foot forward and place the toe on the ground in the position it occupied in *Wall bar grasp* position.

"Two."

Bring the right foot up to the left and raise the body into the *Wall bar grasp* position keeping the arms straight.

C.F.—(1) Bending the arms. (2) Feet brought too close to the apparatus.

7. (Arch hang.) **Arms—Bend** (Plate 20, Fig. 50, e). "*Bend.*" Keeping the elbows well out and back, bend the arms as much as possible, allowing the ankle joints to stretch naturally as the body is pulled upward.

C.F.—Elbows not kept back and away from the bars.

Is a further preparation for stronger *Heaving* exercises encouraging the employment of the heaving muscles of the back.

Arms—Stretch. "*Stretch.*"

Lower the body to its former position by stretching the arms evenly.

8. (Under beam, shoulders parallel to it.) **Over grip, Under grip, Oblique grip—Up.** (Under beam shoulders at right angles to it.) **Cross grip—Up.** (Plates 20 to 22, Figs. 51 to 54.) "*Up.*"

Raise the heels, bend the knees, jump upward, at the same time swinging the arms upward, and grasp the beam as ordered.

On the Feet—Down. "*Down.*"

Raising the body a few inches by a slight pull with the arms, quit the grasp of the beam with the hands, swing the arms downward and drop to the ground on the toes, landing in the usual manner by bending and stretching the knees.

C.F.—(1) Not at once taking the proper grip. (2) Heavy landing.

9. Over grip. (Plate 20, Fig. 51.)

Hands grasping the beam a little more than the width of the shoulders apart, finger nails to the front. When hanging from the beam the body should be well braced, the head slightly back and the chin drawn in, knees straight, toes together and pointed.

C.F.—(1) Head pushed forward. (2) Body slack. (3) Shoulders forward. (4) Legs apart. (5) Back hollowed by bracing back the legs.

The correct holding of the hanging position with the various grips constitutes an exercise in itself when properly taken and should be regarded as such.

These hanging positions are used as starting positions for most of the *Heaving* exercises.

When grasping a *Bar*, all the various grips described should be taken, with thumbs round it.

The method of jumping up to and down from the beam or bar is described under *J. and V. ex.* (paras. 8, above, and Sec. 42, 5.)

10. Under grip. (Plate 21, Fig. 52.)

As for para. 8, above, except that the hands will be on the other side of the beam, finger nails to the rear.

C.F.—As for para. 9, above.

11. Cross grip. (Plate 22, Fig. 54.)

As for para. 8, above, except that the hands will be close together on opposite sides of the beam and the shoulders at right angle to it.

C.F.—As for para. 9, above.

12. Oblique grip. (Plate 22, Fig. 53.)

As for para. 8, above, except that the hands will be rather more than the width of the shoulders apart on opposite sides of the beam and the line of the shoulders diagonal to it.

C.F.—As for para. 9, above.

13. (Overgr., Undergr., Crossgr., Obliquegr.) Arms—Bend. (Plates 20 to 22, Figs. 51 to 54.) "*Bend.*"

Maintaining the correct position of the body from head to heels, as in the hanging position, bend the arms as much as possible keeping the elbows well back.

C.F.—(1) Head and chin pushed forward, back rounded and chest flattened. (2) Elbows and shoulders not kept back enough. (3) Legs bent at the knees and apart.

It is in these exercises especially that attention should be drawn to the danger of attempting to "pull up" a large number of times at the expense of correctness of style. It is better to raise the body only once part of the way to the beam maintaining a good position than to "pull up" the whole way several times in bad or indifferent style.

Arms—Stretch. "Stretch."

Lower the body evenly to its former position by straightening the arms.

C.F.—Lowering to a slack position.

14. (Overgr. or undergr. or with A. b.) **Side travelling.** "Begin."

Shift the grasp of the left hand to the left along the beam as far as can be conveniently managed, then shift the right hand an equal distance also to the left, and repeat the movements as often as necessary.

C.F.—Jerking the legs and losing the correct position of the body.

15. (Overgr.) **Side travelling changing grip.** (Plate 22, Fig. 55.) "Begin."

By means of a slight twist, turn the body forward to the left, quit the grasp of the beam with the right hand and seize it again with *Under grip* on the same side of the beam and on the other side of the left hand. Take the next pace in a similar manner by turning the body backward, quitting with the left hand and again seizing the beam with *over Grip*, and so on.

C.F.—As for para. 9, above.

16. (Obliquegr.) **Backward travelling with Arms bending between each pace.** "Begin."

Travel backward along the beam by shifting the grasp of the hands alternately one behind the other.

C.F.—(1) Loss of position. (2) Hands too close together on the beam.

17. (Overgr.) **Side travelling with swing.** (Plate 23, Fig. 56.) "Begin."

Keeping the legs straight, swing the body in the direction of the beam, and as it swings to the left (leading hand) shift the grasp of that hand along the beam to the left and on the return swing shift the grasp of the right hand the same distance to the left.

C.F.—(1) Circling the legs. (2) Lifting the hand too high. (3) Hands too close together.

18. (Undergr.) **Upward circling** (beam or horizontal bar). (Plate 23, Fig. 57, *a* to *f*.) "*Up*."

Keeping the legs together and the knees straight, bend the arms and the hip joints, swing the legs over the beam and raise the body to the "First position" described in Sec. 43, 15.

Has also a strong effect on the abdominal muscles.

The following progressive steps may be adopted in teaching this exercise :—

(a) Beam head height, left foot forward (the swing obtained from the rear leg assists the circling).

(b) Beam a little under the height of the stretched arms, and the circling assisted by a slight spring from the feet.

(c) Beam above height of stretched arms.

(d) Exercise can be done with straight arms and legs in the final stages.

19. (First pos. with fingers to rear, thumbs to front.) **Downward circling**. (Plate 23, Fig. 57, *f* to *n*.) "*Down*."

Bending forward over the beam from the hips, and keeping the legs straight, lower the body and legs steadily to the starting position for *Upward circling*. As the body is lowered the legs should be kept close to the beam till the insteps touch it.

C.F.—(1) Movement performed too quickly and without sufficient control. (2) Legs thrown forward.

20. (**Climbing**. (Plate 24, Fig. 58 *a* to *l*.) "*One*" or "*Climb*."

Grasp the rope with the left hand as high as possible.

"*Two*."

Grasp the rope with the right hand immediately under the left.

"*Three*."

Keeping the arms straight raise the thighs to a horizontal position, grip the rope between the inside of the knees and the outside of the feet, right foot in front of the left, the rope passing between the left shin and right calf (*i.e.* over the left instep and outside the right heel).

"*Four*."

Maintaining a firm grip of the rope with the legs, bend the arms and straighten the legs without any undue hollowing of the back.

(Every alternate pace.) "*One*" or "*Climb*."

As above but right hand grasping as high as possible.

"*Two*."

As above but left hand under right.

" Three."

As above but left foot in front of right.

" Four."

As above.

When the correct method has been acquired and the pupil is sufficiently strong the knees may be raised in the third movement as high as possible without bending the arms.

21. Down. (Plate 24, Fig. 58 *l* to *s*.) *" One "* or *" Down."*

Lower the body to the full extent of the arms allowing the rope to slip through the legs.

" Two."

Grasp the rope in line with the breast with the lower of the two hands.

" Three."

Grasp the rope with the upper of the two hands immediately above the other.

In descending a rope moving *" free,"* the position of the body and legs should be as in the third movement of climbing, para. 20, above, and the body lowered hand under hand.

22. Climbing—Hand over hand without use of Feet. (Plate 25, Fig. 59.) *" Begin "* or *" Climb."*

Grasp the rope with the left hand as high as possible, place the right hand immediately underneath the left. Pull to the breast and proceed hand over hand with arms bent and legs parallel with the rope, toes pointed to the ground.

" Down."

Hand under hand.

C.F.—(1) Looking down. (2) Bending the knees. (3) Opening and kicking the legs. (4) Over reaching of the hands. (5) Cramping the chest, i.e. not keeping the elbow back.

23. Climbing with double rope. *" One "* or *" Climb."*

Grasp the left rope with the left hand as high as possible.

" Two."

Grasp the right rope with the right hand level with the left.

" Three."

Pull to the chest.

" Four."

Proceed by moving one hand at a time and pulling with that one while raising the other on the other rope. The legs should be kept hanging parallel with the ropes and the feet together pointing to the ground.

"Down."

Come down the same way, moving the hands down the rope.

C.F.—(1) Not reaching up with the hands. (2) Not pulling to the chest; jumping up. (3) Legs being forced forward. (4) Elbows not well back. (5) Head carried badly.

24. The class will be drawn up, standing at ease, in two ranks in close order, facing the shelf and about 8 to 10 paces away. **Mounting shelf with assistance (from below).** (Plate 26.) *"One."* (Fig. 60.)

Both ranks spring to *Attention*. Front rank double out and take right foot forward position, with right foot 12 to 15 inches in front of the edge of shelf and dividing the intervals evenly. Rear rank remain at *Attention*.

"Two." (Fig. 61.)

Front rank turn left about so as to face the rear rank, keeping the body erect, placing the hands with the fingers interlaced on the upper part of the left thigh.

"Three." (Fig. 62.)

Rear rank double forward and take *Right F. forw. pl. pos.* with the weight of the body on the right foot, which should be a few inches to the right of the front rank man's forward foot, the left heel raised, and the hands on the shoulders of the front rank.

"Four." (Fig. 63.)

Rear rank place the left foot in the front rank man's hands, spring from the ground with the right foot and straighten the left leg, at the same time transferring the hands from the shoulders to the edge of the shelf, and, with the assistance of the front rank, rise above the shelf, straightening the arms, raising the seat well up and bending the right knee, and place the right foot on the shelf close to the right hand.

To assist in this movement, the front rank (as the rear rank man straightens his leg after springing from the ground) will bring the right foot smartly up to the left, at the same time raising the locked hands upward as high as possible and slightly forward.

All these movements must be performed rapidly and continuously.

"Five." (Fig. 64.)

Rear rank, turning left about, spring smartly to *Attention* on the shelf.

Front rank come to *Attention*.

"Front rank Fall-in."

Double to the places previously occupied by the rear rank, turn about, halt and stand at ease (moving "free").

About one yard for each man should be quite sufficient interval for the performance of this exercise.

25. (Attention on shelf.) **Downward circling.** *"One."*

Assume *"First position"* (Sec. 43, 15), with hands reversed on edge of shelf, and legs resting on it.

"Two."

Circle downward steadily to *Undergr. hang. pos.* (para. 10, above). Drop lightly to the ground, as usual, and remain at *Attention*.

"Fall In."

Double to the places that the front rank previously occupied, turn about, halt and stand at ease (moving "free").

The ranks will thus be changed ready to repeat the exercise with the other rank.

Note.—At first the instructor should assist each individual when circling downward until he is sure that each man can perform this part of the exercise with safety. (Plate 27, Fig. 65.) The men should, however, be trained to circle down without expecting assistance.

26. (As in para. 24, above.) **One rank mounting shelf with assistance** (judging the time). *"Front rank, below shelf—Ready."*

Execute the movements described in para. 24, above, as quickly as possible, without any pause between them.

"Rear rank—Up." "Fall in."

Front rank fall in as for para. 24, above.

Downward circling. *"Down."*

Execute the movements described in para. 25, above, observing slight pause in the *"First position,"* and circling downward steadily, again observing a slight pause before dropping to the ground.

"Fall In."

As above for para. 25, above.

Note.—Repeat with the other rank.

27. (Attention on shelf.) **Downward jumping.** *"Down."*

The men will be turned to the right or left as required, and will jump downward as directed (Sec. 43, 10) off one foot, but moving "free," and taking the jump in their stride as they arrive at the edge of the shelf, the first man jumping a little to the right, the second a little to the left and so on, so as to be quite

clear of each other when landing. There must be no attempt to increase the depth of the drop by jumping upward, on the contrary, the drop should be minimized as much as possible by jumping directly towards the mattress. (The use of a mattress is necessary in a gymnasium with a hard floor when jumping from the greater heights.) In landing the body should be inclined slightly *forward* rather than backward, and as each man "lands" he should at once *move forward* 3 paces, wheel and return to his place in the class (but as a front rank man), moving "free," and by the flanks and rear of the class. The class will then be in position ready to repeat the exercises with the other rank.

The pace at which the men follow each other in jumping should at first be slow (if necessary the men may jump individually by word of command), but with practice the pace should be increased till it can be taken very rapidly.

28. (As in para. 24, above.) **Both ranks mounting shelf with assistance.** *Front rank below shelf—"Ready."*

As in para. 24, above.

"*Rear rank—Up.*"

As in para. 24, above.

"*Front rank—Up.*"

Front rank turn about and rear rank step forward close to the edge of the shelf, and stand with feet astride, knees slightly bent, body inclined forward and the hands ready to assist the front rank. Front rank jump up, seize the shelf with both hands and pull up as quickly as possible. As soon as the heads of the front rank appear above the shelf, the rear rank, placing the right hand at the back of the head and the left under the chin, assist the front rank over the "dead point" at the end of the pull up. (Plate 27, Fig. 66.) The front rank, thus assisted, mount the shelf, as usual, turning left about.

Both ranks should then be at *Attention* in two ranks, front rank in front, with their backs to the wall.

Note.—Should the shelf be too high for any man to reach by jumping, his rear rank man will lie down flat on the shelf, and, reaching as far downward as possible with his right hand, hold the right hand of the front rank man with a "butcher's grip," placing his left hand on the edge of the shelf to give him lifting purchase. The front rank man will then spring from the ground, and, assisted by the rear rank man pulling, will seize the edge of the shelf with the left hand and immediately transfer his right hand also to the edge of the shelf. The rear rank man must then at once jump to his feet, and both will proceed as above directed.

PLATE 26.

Hvg. Ex.

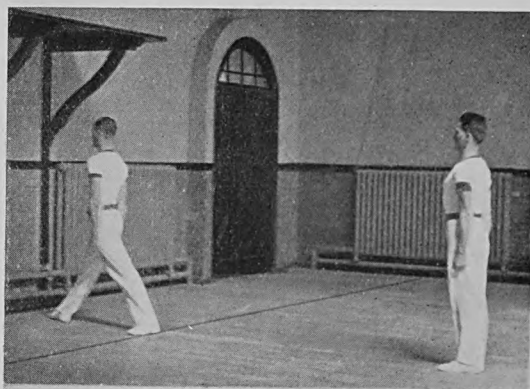


Fig. 60.

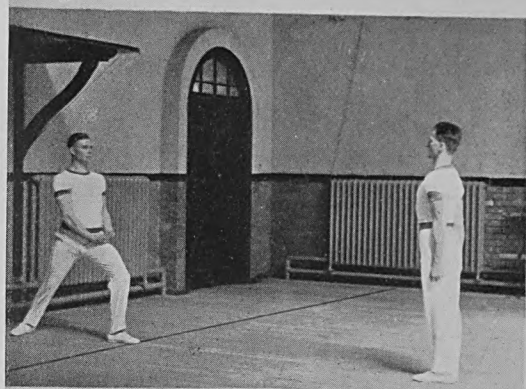


Fig. 61

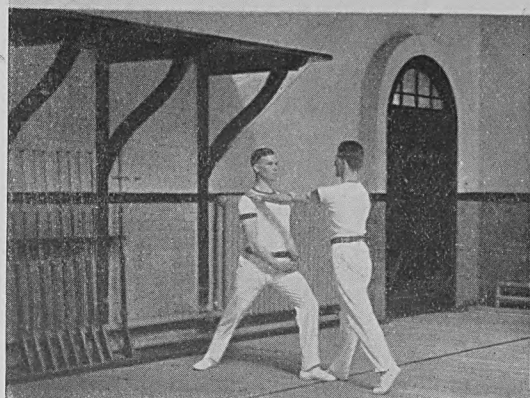


Fig. 62

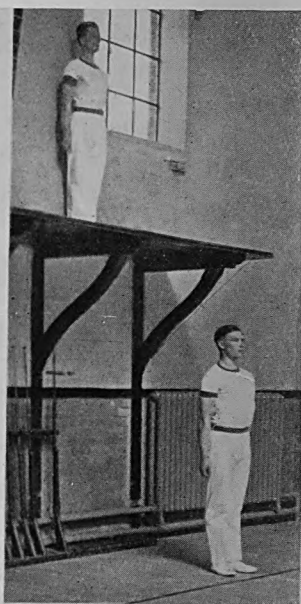


Fig. 64

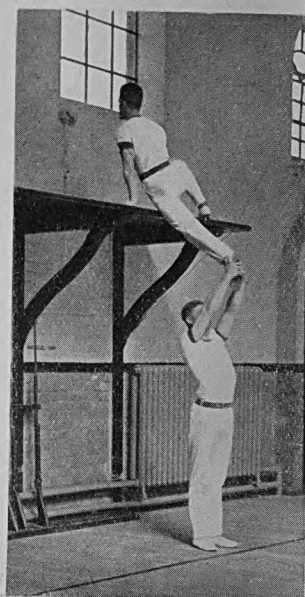


Fig. 63

PLATE 27.

[Follows Plate 26.

Hgv. Ex.

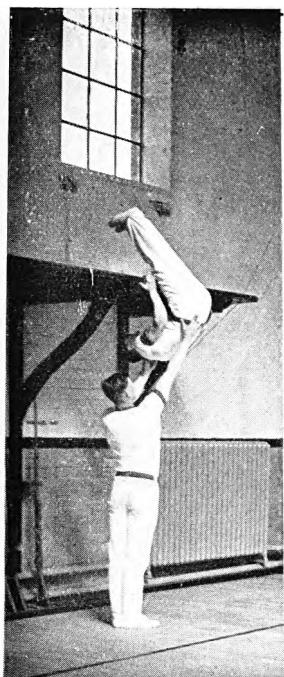


Fig. 65.

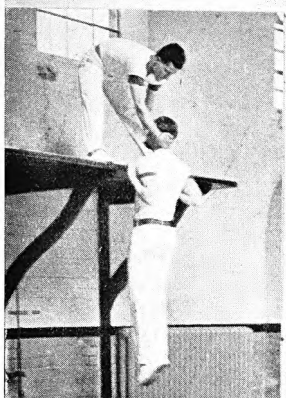
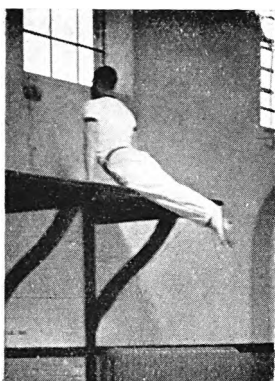
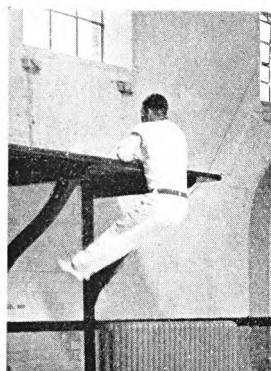


Fig. 66.



c.



b.

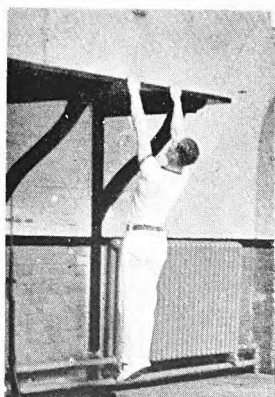


Fig. 67 a.

After jumping or circling down, the class will fall in as usual, with changed ranks ready to repeat the exercise with the other rank in front.

29. (As in para. 24, above.) **Both ranks mounting shelf** (judging the time). "Go."

As in para. 28, above.

Both ranks will spring to *Attention*, the front rank will double forward below the shelf; after a slight pause the rear rank will follow, and both will proceed as in para. 28, above, without further word of command.

30. (Attention below shelf.) **Mounting shelf** (both forearms leading). (Plate 27, Fig. 67.) "Up."

Spring lightly from the toes gripping the edge of the shelf (as for para. 9, above), *Over grip on beam*, and show position of hang, pull to the breast, and place both forearms on the shelf, at the same time allowing the legs to go forward.

On the backward movement of the legs, press up to the *First position*. Place the right foot on the shelf near the right hand, turn left about to position of *Attention*.

C.F.—(1) Forearms not placed on shelf together. (2) Kicking with the legs. (3) Bad timing.

(Attention on shelf.) **Downward circling**. "Down."

As for para. 25, above.

31. (Attention below shelf.) **Mounting shelf both Hands leading**. "Up."

From the *Hang position*, with the hands in the *Both hands leading* position, perform the exercise as for *Both forearms leading*, without moving hands or allowing the elbows to touch the shelf.

C.F.—(1) Bad timing in the forward and backward movement of the legs. (2) Not raising the elbows sufficiently.

(Attention on shelf.) **Downward circling**. "Down."

As for para. 25, above.

38. LATERAL EXERCISES

1. This group consists chiefly of the exercises of *turning* the trunk and *bending* it *sideways*.

The side muscles of the trunk and the adductors, abductors and rotators of the thigh are those which are specially affected. The muscles of the spine and front of the trunk are also employed, and the exercises have consequently a close relation to the *Dorsal* and *Abdominal* exercises, especially to the latter.

The Lateral exercises develop the lateral flexibility of the spine and its power of rotation on its axis. By the alternate elevation and depression of the ribs they increase the general mobility of the thorax. The "one-sided" nature of these exercises is therefore advantageous if care is taken, as should always be the case, to perform them an equal number of times in each direction; symmetrical development of the body is then ensured. The strengthening of the muscles employed also greatly facilitates the general control of the body.

Somewhat different effects are obtained in this group by varying the position of the feet and legs by kneeling and sitting, and so fixing the pelvis more or less as the case may be. And progression is obtained by raising the centre of gravity (by changing the position of the arms) thereby increasing the leverage, and also by increasing the speed with which an exercise is performed.

The Lateral exercises are divided into the following sub-groups:—

- Group i. Trunk turning. Paras. 2 to 3, below.
 - „ ii. Trunk bending sideways. Paras. 4 to 13, below.
 - „ iii. Trunk twisting with Arm movements. Paras. 14 to 16, below.
 - „ iv. Exercises "on one Hand," on the ground, bench or at wall bars. Paras. 17 to 18, below.
 - „ v. Exercises of lunging outward. Paras. 19 to 22, below.
2. (F. cl. or F. sidw. pl., or F. outw. pl., or F. forw. pl., and H. f., or A. b., or N. r., or A. upw. str.) **Trunk turning—(To the left—Turn)—(Forward—Turn.)** "One" or "Turn."

Keeping the head in the same relative position to the shoulders as at *Attention*, the feet firm on the ground and the legs straight, turn the trunk steadily as far as possible to the left.

"Two."

Turn the trunk steadily forward to its original position.

"Three."

Turn the trunk to the right as above.

"Four."

Turn the trunk forward as above.

- C.F.—(1) Feet not kept firm on ground. (2) Knee bent.
 (3) Head and shoulders not kept in their relative position.
 (4) Small of the back hollowed.

The starting positions for the feet and arms are placed in progressive order.

It should be noted that in *F. forw.* and *F. outw. pl.*, when the left foot is advanced the turning should only be made to the

left and *vice versa*, as the required fixing of the pelvis will not otherwise be obtained.

Note.—*Arms stretching upward and sideways* may also be taken from the A. b., Tr. turn, position.

3. (As for para. 2, above.) **Trunk turning quickly.** “One”—“Two”—“Three”—“Four.”

As for para. 2, above, but each movement performed quickly.

Or “One.”

Turn the trunk to the left as above.

“Two.”

Turn the trunk to the right as above.

C.F.—As for para. 2, above.

4. (1 pace from and side towards wall bars.) **On the third (fourth, fifth) bar, left Foot—Support.** “*Support.*”

Raise the left leg sideways, keeping the knee straight and pointing the toe upward, and insert the foot between the third and fourth bars, gripping them tightly by pressing the toes against the latter and the heel against the former.

Used as a starting position for *Trunk bending sideways* when a stronger effect is required.

Foot inward—Place. “*Place.*”

Resume the starting position.

5. (F. cl., or F. sidew. pl., or F. forw. pl., and H. f., or A. b, or one A. upw. one A. downw. str., or A. sidew. str., or A. upw. str., or N. r.) **Trunk bending sideways.** “One.”

Without altering the relative position of the head, shoulders and arms, bend the trunk steadily as far as possible to the left.

“Two.”

Raise the trunk steadily to the upright position.

“Three.”

Bend the trunk to the right as above.

“Four.”

Resume the upright position as above.

Or (To the left—Bend.) “*Bend.*” (Upward—Stretch.) “*Stretch.*”

C.F.—(1) Feet not kept firm on the ground. (2) Trunk turned or inclined forward or backward. (3) Relative position of head not maintained. (4) Legs and hips not kept steady.

The starting positions for the feet and arms are placed in progressive order, the N. r. position being taken after A. upw.

str. on account of the greater difficulty experienced in maintaining it correctly, although the effect of the leverage is not so strong.

When using the *F. forw. pl.* starting position, the bending should only be made to the left when the left foot is advanced and *vice versa* for the reason mentioned *re* the "*Turnings*." And in the same way when one *A. upw.* and one *A. downw. str.* is used the bending should only be to the right when the left arm is stretched upward and *vice versa*.

Note.—*Trunk bending sideways* may also be taken with *Foot support* on wall bars or bench and the effect thereby increased.

6. (F. cl. one A. b. one Hand H. f.) **Trunk bending sideways with Arm stretching upward.** "*One.*"

Bend the body as for para. 5, above, at the same time stretching the arm.

"*Two.*"

Return to the starting position.

"*Change.*"

Reverse position of the arms and repeat in the opposite direction.

C.F.—As for para. 5, above, and (5) Arm not fully extended and kept close to the head.

7. (H. sup. one A. upw. str. one Hand H. f.) **Trunk bending sideways (Beam).**

As for para. 5, above.

8. (H. f., or N. r. and F. sidew. pl., or F. astr. A. sidew. str.) **Trunk bending sideways quickly.** "*One*"—" *Two* "—" "*Three* "—" "*Four.*"

As for para. 5, above, but each movement performed quickly.

9. (F. astr. H. f.) **Trunk bending from side to side.** (Plate 28, Fig. 68.) "*Begin.*"

Bend the trunk and head from side to side to their utmost limit.

C.F.—(1) Trunk turned or inclined forward or backward. (2) Limiting the movement. (3) Raising the heel.

This exercise should be done with a sweeping movement, with an extra effort at the end of each bend.

10. (On Knee (L. or R.) Leg sidew. str. Hands on Head.) **Trunk bending sideways.** (Plate 28, Fig. 69.) "*Begin.*"

As for para. 5, above.

11. (F. astr. "S." pos. (Right Arm upw.)) **Trunk bending sideways.** (Plate 28, Fig. 70.) "*Begin.*"

Bend the trunk and head to the left to its utmost limit, returning to the upright position.

"*Change.*"

Reverse position of hands and repeat to the right.

In performing this exercise, to obtain the full effect use must be made of the arm raised above the head.

12. (H. support one A. upw. one Hand H. f.) **Trunk bending sideways with Leg raising** (side against beam). "*One.*"

Keeping the left foot firm and the left leg (the one touching the beam) straight, *incline* the body over the beam to the left and at the same time raise the right leg, keeping it straight and in line with the body.

"*Two.*"

Resume the starting position.

C.F.—The leg not raised at once or sufficiently high.

This exercise is not a Trunk bending in the usual meaning of the term as the spine is *inclined* to one side and not bent laterally.

13. (F. astr. A. sidew. str.) **Trunk bending downward with turning.** "*One*" or "*Bend.*"

Keeping the back straight, incline the trunk slowly forward, at the same time turning it in the direction named to the fullest possible extent without losing position.

"*Two*" or "*Stretch.*"

Slowly resume the starting position.

C.F.—(1) Head and chin poked forward. (2) Bending the back. (3) Bending the knees. (4) Arms not kept in line. (5) Breathing restricted.

14. (F. astr. one Hand H. f.) **Trunk twist and single Arm Fling.** (Plate 29, Fig. 71.) "*Begin.*"

Keeping the feet firmly on the ground with the knees straight, twist the body fully to the left, at the same time swing the left arm outward and upward to the *flight* position, without pausing allow the arm and body to return to the starting position.

"*Change.*"

Repeat to the right.

C.F.—(1) Raising the heel. (2) Allowing the arm to drop. (3) Not turning the head. (4) Restricting the movement.

This exercise may be performed a stated number of times.

15. (On the Hands and Ks.) Trunk twist with single Arm flinging. (Plates 30 and 31, Fig. 72.) "*Begin.*"

Pass the left arm under the right, twist the body vigorously to the left, increasing the movement by swinging the left arm in a sweeping movement upward, at the same time turning the head towards the hand and return to the starting position.

"*Change.*"

Place the left hand on the ground and repeat to the right.

- **C.F.**—(1) Not sufficient twist to the body. (2) Not keeping the knees on the ground.

In the first stage of this exercise the knees should be slightly apart. As a form of progression it may be performed with knees together.

16. (Sit. pos. one Hand H. f.) Trunk twist with single Arm Flinging. (Plate 31, Fig. 73.) "*Begin.*"

As for para. 14, above.

"*Change.*"

Place the left hand on the hip and repeat to the right.

- **C.F.**—(1) Not sufficient twist to the body. (2) Not keeping the left arm still.

The starting position in this exercise being on the ground has the effect of locking the pelvis and thereby producing a greater lateral effect.

17. (On the Hands (on bench or ground or at wall bars).) On the left Hand—Turn. (Plate 32, Fig. 74, *a* and *b*.) "*Turn.*"

Raise the right hand from the ground and with it take the *H. f.* pos., at the same time turn the body to the right, bringing the weight on the left arm which should be at right angles to the body and place the right foot immediately over the left.

Note.—When at the wall bars the free hand should grasp the highest bar that can be reached in line with the other hand.

On both Hands—Turn. "*Turn.*"

Resume the starting position.

- **C.F.**—(1) Dropping the hips. (2) Bending the body forward or backward.

18. (On the left or right Hand (on bench, or ground or at wall bars).) Leg raising. (Plate 32, Fig. 74, *c*.) "*One.*"

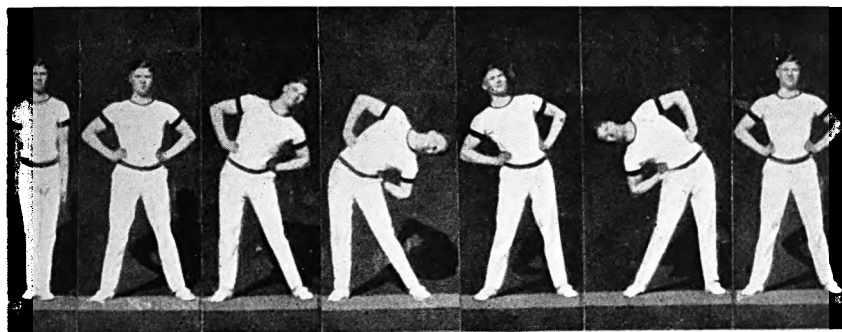
Raise the right leg as high as possible allowing the hips to follow the movement.

"*Two.*"

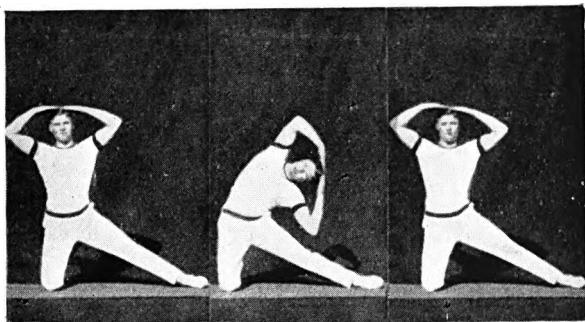
Resume the starting position.

PLATE 28.

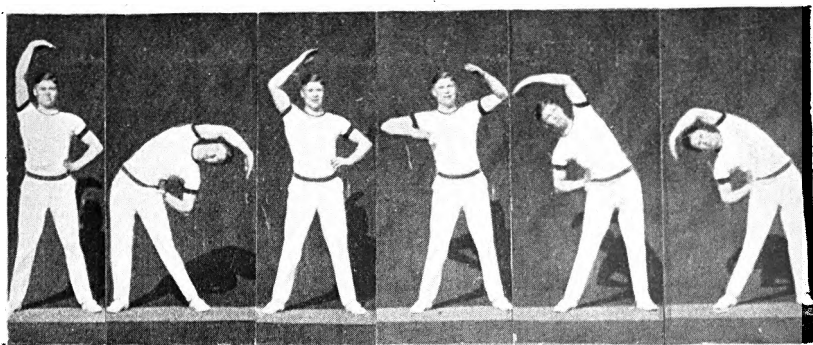
Lat. Ex.



a. b. c. d. e. f. g.
Fig. 68.



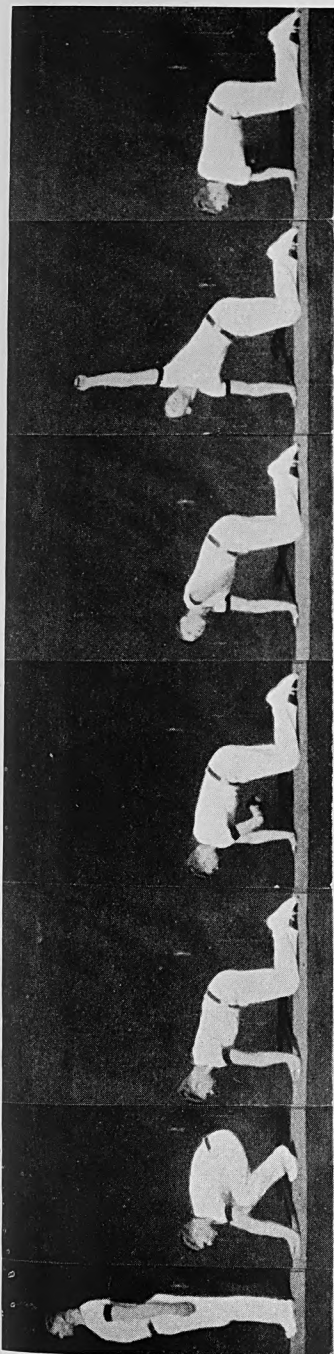
a. b. c.
Fig. 69



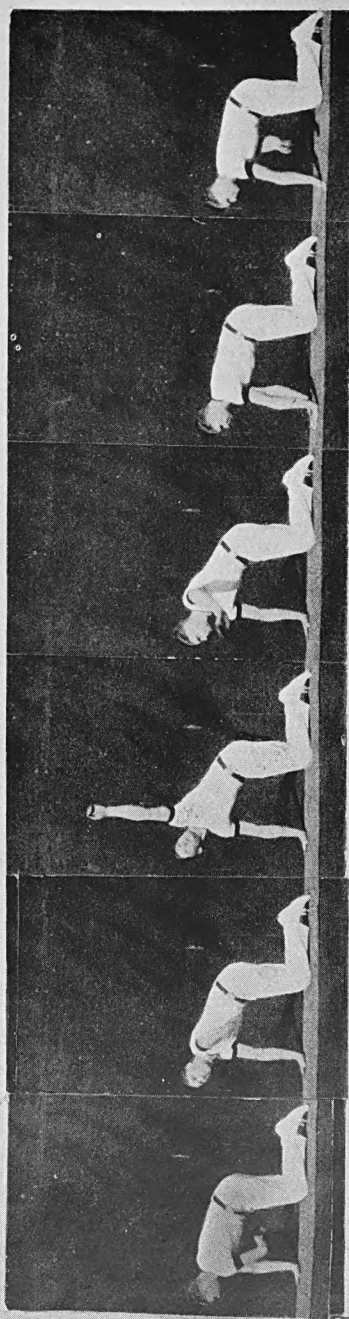
a. b. c. d. e. f.
Fig. 70

PLATE 30.

Lat. Ex.



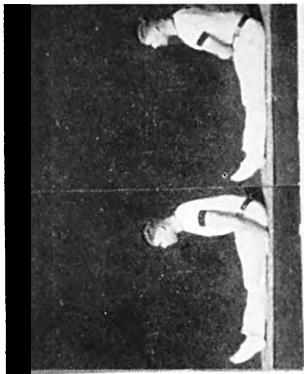
a b c d e f g
Fig 72.



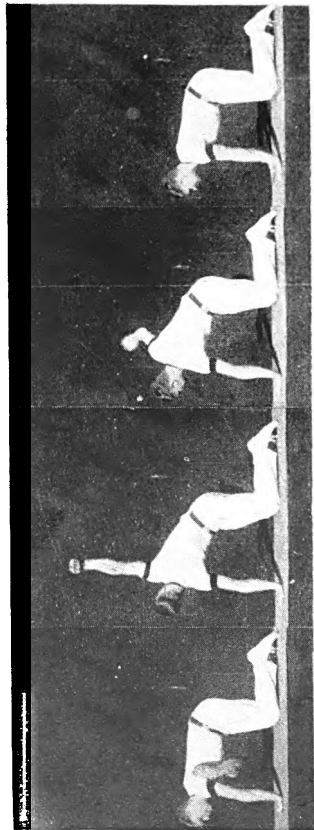
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Cont'd Plate 31

PLATE 31.

Lat. Ex.



a b
Fig 73



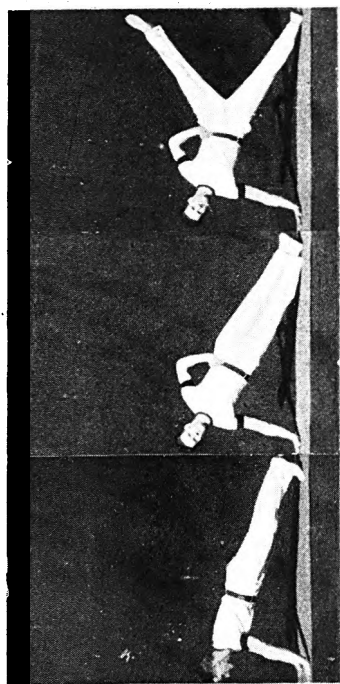
q. r s t.
Fig 72.



c d e f g h.
Fig 73 Contd.

PLATE 32.

Lat. Ex.

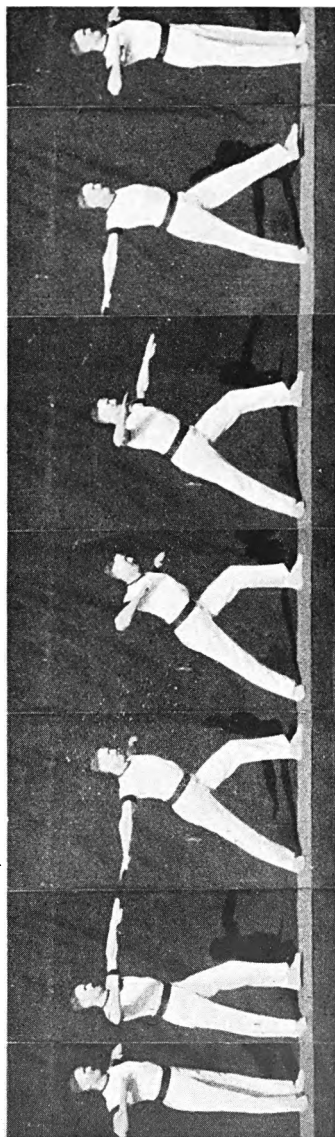


c.

b.

a.

Fig. 74.



g.

f.

e.

d.

c.

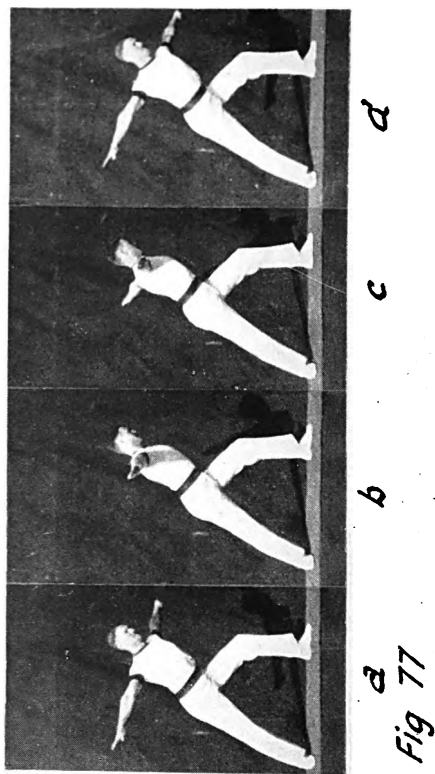
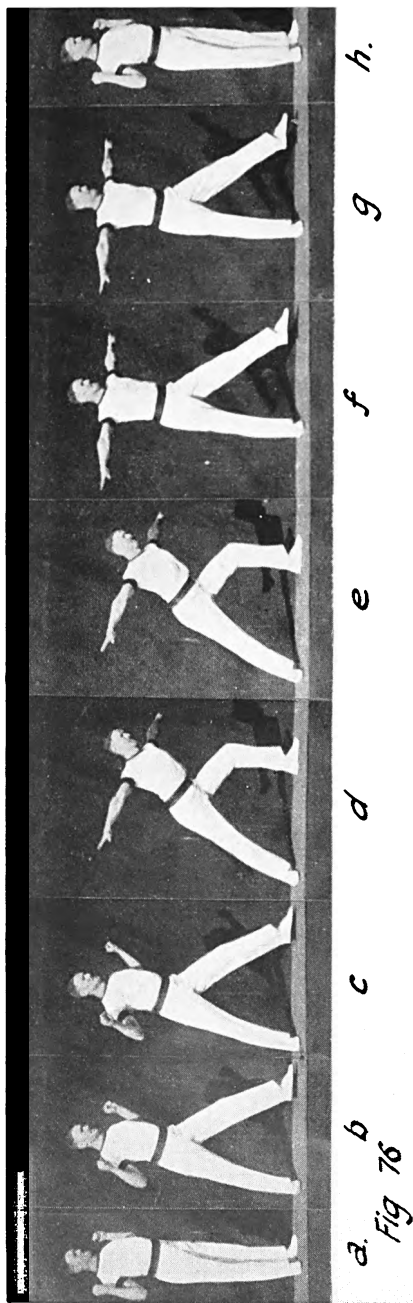
b.

a.

Fig 75

PLATE 33.

Lat. Ex.



19. (F. full o., A. b.) **Left Arm upward right Arm downward left Foot outward—Lunge.** "*Lunge.*"

Lunge outward as in Sec. 33, 19, and stretch the arms sharply upward and downward, the rear hand about a hand's breadth from the thigh, the movement of the arms being completed at the moment the foot reaches the ground.

Foot inward—Place. "*Place.*"

Resume the starting position.

20. (F. full o., A. forw. b.) **Outward lunging with Arms flinging.** (Plate 32, Fig. 75.) "*Lunge.*"

As for Sec. 33, 20, at the same time fling the arms sideways and forward as in Sec. 35, 29.

Foot inward place. "*Place.*"

Return to the starting position again flinging the arms as above.

C.F.—As for Sec. 33, 19, and Sec. 35, 29, and Bad co-ordination.

21. (F. full o., A. b.) **Outward lunging with Arms stretching sideways.** (Plate 33, Fig. 76.) "*Lunge.*"

As for Sec. 33, 19, at the same time stretch the Arms sideways as in Sec. 35, 8.

Foot inward—Place. "*Place.*"

Resume the starting position.

22. (F. full. o., A. b.) **Outward lunging with Arms stretching sideways and Trunk turning.** (Plate 33, Fig. 77.) "*Lunge.*"

As in Sec. 33, 19, at the same time turn the body to the left and stretch the Arms sideways.

Foot inward—Place. "*Place.*"

Resume the starting position.

C.F.—(1) Not turning the body sufficiently. (2) Arms lowered and too far back.

39. BALANCE EXERCISES

1. Balance exercises are those which develop the power of balancing the body under varying conditions, and are divided into two sub-groups, viz. :—

Group i. "Free standing" Balance exercises. Paras. 2 to 9, below.

„ ii. Balance exercises on apparatus (beam). Paras. 10 to 17, below.

Progression in the Free standing Balance exercises is effected by reducing the base on which the body is supported, raising the centre of gravity of the body by altering the position of the arms from *H. f. to A. upw. str.*, and in the exercises on apparatus by increasing the height above the ground at which the exercises are performed.

The Free standing exercises are taken in a precise and definite manner, with the whole class working by word of command. The exercises on apparatus admit of and require more freedom of movement for securing and maintaining the balance, and are taken individually or by several men at a time, working independently, words of command being dispensed with as much as possible.

The Balance exercises employ a large number of muscles, but require little actual strength. They require very accurate co-ordination of movement, and consequently have an excellent effect on the brain and nerves. They cultivate the power of control over the body and limbs, overcome stiffness and awkwardness, give an easy carriage to the body, and make the movements free and well ordered. They also train the men's "nerve" and accustom them to moderate heights.

2. (H. f., etc.) **Left (R.) Knee—Raise.** (Plate 34, Fig. 78, *a* and *b*.) "*Raise.*"

Keeping the body erect, bend the left or right knee and raise it upward until the thigh is at right angles to the body and the lower leg hanging straight downward with the toe pointing to the ground.

Knee—Lower. "*Lower.*"

Lower the leg to its original position.

In this and in all the other *Free standing Balance* exercises, the words of command should be given comparatively slowly and the movements performed steadily and evenly, and not by jerks.

C.F.—(1) Knee not raised high enough. (2) Lower leg not vertical. (3) Standing leg bent. (4) Trunk and head not kept erect.

3. (H. f., etc.) **Knee raising.** "*One.*"

Left K. r.

"*Two.*"

K. lower.

"*Three.*"

Right K. r.

"*Four.*"

K. lower.

4. (H. f., etc., K. r.) **Leg forward—Stretch.** (Plate 34, Fig. 78.)
"Stretch."

Keeping the body steady and the thigh raised as much as possible, stretch the leg and foot forward.

Knee—Bend. *"Bend."*

Bend the knee to *K. r.* position.

C.F.—(1) Body, head and standing leg as in para. 2, above.

(2) Knee lowered.

From the *Knee raise* position, *Leg stretching* may be performed forward, sideways, and backward.

5. (H. f., etc.) **Leg raising forward.** *"One."*

Keeping both legs straight and the body erect, raise the left leg forward as high as possible, toe pointed.

"Two."

Lower the leg to its original position.

"Three."

Raise the right leg as above.

"Four."

Lower the leg to its original position.

C.F.—Body, head and standing leg as in para. 2, above.

Leg raising forward, sideways, and backward may be combined as required, also with varied arm movements.

6. (H. f., etc.) **Leg raising sideways.** (Plate 34, Fig. 79, *a.*)
"One."

Keeping both legs straight and the body as erect as possible, raise the left leg sideways to the left, toe pointed.

"Two."

Lower the leg to its original position.

"Three."

Raise the right leg as above.

"Four."

Lower the leg to its original position.

C.F.—(1) Body inclined more than absolutely necessary.

(2) Legs bent.

7. (H. f., etc.) **Leg raising backward.** (Plate 34, Fig. 79, *b.*)
"One."

Keeping both legs straight and the body erect, raise the left leg backward as far as possible, toe pointed.

"Two."

Lower the leg to its original position.

"Three."

Raise the right leg as above.

"Four."

Lower the leg to its original position.

C.F.—(1) Body inclined forward. (2) Leg bent. (3) Small of the back too much hollowed.

8. (H. f., K. r.) **Legs stretching forward, sideways, and backward.** (Plate 34, Figs. 78 and 79.) **"Begin."**

As for paras. 5, 6, and 7, above, and before each stretching movement the *knee raise* position is taken up.

C.F.—As for paras. 5, 6, and 7, above.

9. (H. f., F. cl. or A. sidew. str.) **Poise balance forward.** (Plate 34, Fig. 80.) **"One."**

Slowly incline the body forward, bending the right (left) knee, keeping the trunk and rear leg in the same straight line. The body should assume a position nearly parallel to the ground.

"Two."

Resume the starting position.

C.F.—(1) Not bending the standing leg. (2) Bending the rear leg. (3) Head inclined too far downward. (4) Forcing the head back.

10. **Mounting beam, left Foot leading** (beam up to knee height). **"Mount"** or **"One"**—"Two."

Place the ball of the left foot on the beam and with a slight spring from the ground straighten the left knee, turn at once to the right and place the right foot on the beam in front of the left, assuming an erect position.

C.F.—Not facing the beam in stepping up.

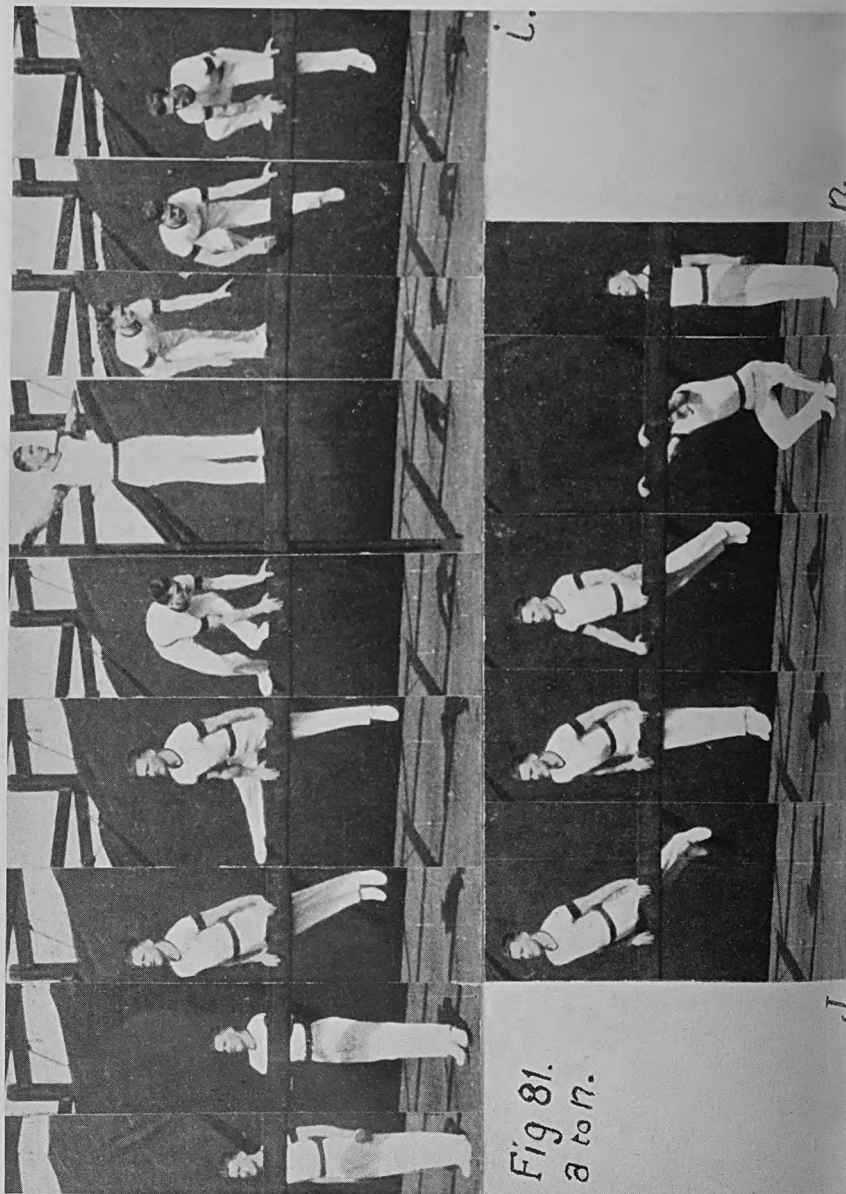
In all *Balance* exercises on apparatus the arms should be used, (unless otherwise directed) to assist in maintaining the balance by being extended or partially extended sideways and raised or lowered with a "give and take" movement as required without any stiffness.

Although executive words of command are here shown, it is better to omit them whenever possible for these *Bal. ex.* on apparatus, so as to put no restraint on the freedom and ease with which the exercises should be performed.

Note.—All *Mounting Beam* exercises should be practised with the right foot leading or assisting, the turnings on the beam being to the left.

PLATE 35.

Bal. Ex.



11. (With run.) **Mounting beam, left Foot leading** (beam between knee and hip height). "*Mount.*"

Mount the beam as in para. 10, above, but with a run, springing lightly off the right foot.

12. (First pos.) **Mounting beam left Foot assisting** (beam over hip height as required). (Plate 35, Fig. 81.) "*Mount.*"

Keeping the knee straight, raise the left leg sideways and place the inside of the foot on the beam; then, turning towards the right and reversing the right hand, place the right foot on the beam close to the left hand and between it and the left foot and assume an erect position with the right foot in front of the left and body turned fully to the right.

C.F.—(1) Taking too long over the exercise. (2) Showing obvious over anxiety.

13. (First pos.) **Mounting beam—Sitting astride.** (Plate 36, Fig. 82, *a* to *k*.) "*Mount.*"

Keeping the knee straight, raise the left leg sideways and place the inside of the foot on the beam, then swing the left leg over the beam to a sitting position astride it, body and head erect, legs straight, hands to the sides.

Grasping the beam in front of the body with the arms straight, swinging both feet backward and raising the seat upward, by taking the weight of the body on the arms, place the toes on the beam with the heels raised.

Rise to the erect position.

14. (Standing on beam.) **Dismounting from beam—Left turn and downward jump.** "*Jump.*"

Turn and jump down as described in Sec. 43, 10.

Or.—(Standing on beam.) **Dismounting from beam—Beam grasp and down.** (Plate 35, Fig. 81, *f* to *n*.) "*Down.*"

By bending the knees or taking one foot off the beam bend down and grasp it with the hands, width of shoulders apart and in front of the feet, taking the weight of the body on the hands turn to a flank and resume the first position, circle or jump down facing beam (according to height).

15. (Standing on beam.) **Walking on beam—Forward.** (Plate 36, Fig. 82, *k* to *o*.) "*Begin.*"

Walk forward steadily maintaining the erect position.

Backward. "*Begin.*"

Walk backward as above described.

C.F.—(1) Looking down. (2) Stooping. (3) When about to lose the balance not pausing to regain it.

With Knee raising. "*Begin.*" Walk forward as described above but with H. f., Knee raising.

C.F.—As above.

These exercises may be carried out on benches, laid on their sides (in pairs).

16. (Standing on beam.) **Turning about.** (Plate 36, Fig. 82, o to r.)

When the left foot is in front turn right about on the ball of both feet keeping the legs straight, or *vice versa*.

17. (Beam grasp.) **Splits on** (beam, hip height). "*Mount*" or "*Begin.*"

Vault on the beam, hands to have left the beam before the feet touch; turn to right or left and show position.

C.F.—(1) Standing too far away from the beam. (2) Not raising the seat high enough. (3) Allowing the hands and feet to be on the beam at the same time.

This exercise to be taken free.

40. ABDOMINAL EXERCISES

1. The abdominal muscles, especially the large muscle in front of the abdomen (*rectus abdominis*), are those which are principally affected by the exercises of this group. These muscles play an important part in maintaining the proper carriage of the body, and are essential for good distance marching.

The *Trunk bendings backward* stretch the front abdominal muscles, *On the Hands* gives static contraction of the same muscles at their middle length, and the *Leg* and *Knee raisings* in the lying and hanging positions and the floor beating and forward reaching shorten them. A normal length and strength of these muscles is thereby produced and the carriage consequently corrected.

Trunk bending backward also increases the mobility of the dorsal portion of the spine and thus tends to lessen the dorsal curve.

Well-developed abdominal muscles provide a firm support for the organs of digestion contained in the abdomen, and the quick moving exercises, like forward reaching, etc., work on the organs themselves.

2. (F. sidew. pl., or F. astr., or Hl. together, or F. forw. pl., and H. f., or A. b., or A. upw. str.) **Trunk backward—bend.** "*One.*"

Keeping the knees **straight**, bend the upper part of the trunk slowly backward, the head commencing the movement and kept well back with the chin drawn in. The bending should *not* be made from the waist alone, but the whole spine should be arched.

Upward—Stretch. “*Two*.”

By reversing the movement raise the trunk to the starting position.

“*Bend*.”

As “*One*” above.

“*Stretch*.”

As “*Two*” above.

C.F.—(1) The bending made only in the small of the back.
(2) Head not carried back sufficiently. (3) Chin not drawn in. (4) Knees bent. (5) Breathing restricted.

As one of the objects of this exercise is to stretch the dorsal portion of the spine, a very great bending backward is not required. At the commencement of the movement, the body should, however, be stretched well upward and then the bending backward in the dorsal region commenced. At first, the bending should be only slight but correct, and as progress is made the bending may be increased by degrees.

Progression in the *Trunk bendings backward* is obtained, as in the *Lateral* exercises, by raising the centre of gravity from *H. f.*, to *A. b.*, to *A. upw. str.*; the position of *N. r.* is not as a rule used with these exercises owing to the difficulty experienced in maintaining the position correctly, a faulty *N. r.* position being very likely to counteract some of the otherwise good effects of the exercises of this group.

Note.—*Trunk bending backward* may also be taken with *Foot support* on wall bars or bench, and to make the exercise still stronger the knee of the standing leg may be bent at the same time as the body.

3. (F. astr., N. r., Tr. forw. b.) **Trunk bending downward** (quickly). “*Begin*.”

Swing the body downward between the legs, pulling vigorously with the hands on the downward swing, allowing it to rebound to the starting position.

This exercise has a good stretching effect on the hamstrings and dorsal groups. To get the full abdominal effect of this exercise no pause should be made in the *Tr. forw. bend* position.

C.F.—(1) Lack of control. (2) Stiffness of movement.
(3) No pull with the hands. (4) No rhythm.

4. (Attention.) **Sitting on ground—Down.** (Plate 40, Fig. 93, *a* to *d*.) "*Down.*"

Passing through the full *K. b.* position place both hands on the ground a little to the rear and at the same time shoot the legs to the front, toes pointed, legs straight, body and head erect, palms of the hands on the ground.

On the Feet—Up. "*Up.*"

Pressing sharply from the ground with the hands and drawing the feet in, spring to *Attention*.

C.F.—Making a small jump forward before bending the knees.

5. (Sit. pos., H. f.) **Trunk inclining backward.** "*Begin*" or "*One.*"

Keeping the body erect and well braced up, incline it steadily backward as far as possible without raising the legs off the ground.

"*Two.*"

Resume the starting position.

This exercise in the early stages can be taught with support at wall bars or with human support, but the full effect of the exercise is best obtained without support and the heels kept on the ground. Care should be taken that the breathing is not restricted, and it should be conducted in normal breathing time.

C.F.—(1) Back rounded. (2) Head poked forward. (3) Breathing restricted. (4) Heels coming off the ground.

6. (Sit. pos., A. b.) **Trunk inclining backward with Arms stretching upward.** (Plate 37, Fig. 86.) "*Begin.*"

As for para. 5, above, but the arms should be stretched upward slowly as the trunk is inclining backward, resuming the starting position.

C.F.—As for para. 5, above, and (5) Stretching and bending the arms too soon.

7. **On the Hands on ground—Down.** (Plate 37, Fig. 83.) "*One.*"

Bend the knees quickly outward, incline the trunk slightly forward and place the palms of the hands on the ground rather more than the width of the shoulders apart, fingers turned slightly inward, arms straight and nearly vertical. The back should be kept straight and the head in the same relative position to the shoulders as at *Attention*.

"*Two.*"

Keeping the arms straight shoot the left foot backward so that the body and left leg is straight and fully stretched.

"Three."

The same with the right foot. The weight should now be supported by the toes and hands, heels together, feet at the normal foot-angle, arms at right angles to the body, head in the same relative position as at *Attention*.

C.F.—(1) Rounding the back and dropping the head forward in the first movement. (2) Body dropped slackly between the arms. (3) Slackening the abdominal muscles and thereby hollowing the back. (4) Raising the seat. (5) Head not kept in its relative position to the body. (6) Arms not at right angles to the body.

As soon as the correct position of *On the hands* can be assumed, the exercise should be done in two movements, i.e., both feet being moved together. The executive word will be *"Down."*

8. On the Feet—Up. (Plate 37, Fig. 84.) *"One."*

Keeping the arms and trunk straight, bend the left knee and bring the foot up to just behind the left hand.

"Two."

Bring the right foot up, and resume the first position of *On the hands*, para. 7, above.

"Three."

Spring to *Attention*.

C.F.—(1) Knees not outside the elbows. (2) Not keeping the rear leg straight. (3) Raising the seat.

As soon as the correct position can be assumed, this exercise can be done in two movements, i.e., both feet being moved together, and the executive word should be *"Up."*

9. (On the Hands on ground.) Arms—Bend. (Plate 37, Fig. 85.) *"Bend."*

Without in any other way altering the position of the body lower it close to the ground by bending the arms.

Arms—Stretch. *"Stretch."*

Resume the starting position by straightening the arms.

The bending of the arms increases the effect on the abdominal muscles.

C.F.—Altering the straight position of the body.

10. (On the Hands on ground.) Arms bending with Legs parting. (Plate 38, Fig. 87.) *"Bend."*

Lower the body close to the ground by bending the arms, at the same time keeping the legs straight, parting them as far as possible.

"Stretch."

Resume the starting position by straightening the arms and closing the legs.

C.F.—(1) Allowing the seat to rise. (2) Bending the knees. (3) Not parting the legs to their fullest extent.

11. (On the Hands on ground.) **Leg—Raising.** "*Raise.*"

Keeping the leg straight, raise it as high as possible, toe pointed, without altering the position of the body.

"Lower."

Lower the leg to the starting position.

This exercise has also a lateral and an oblique effect on the abdominal muscles.

12. (On the Hands on ground.) **Arms bending with Leg raising.** (Plate 38, Fig. 88.) "*Bend.*"

Bend the arms as in para. 9, above, at the same time raise the leg as in para. 11, above.

"Stretch."

Stretch the arms and lower the leg.

13. (On the Hands on ground.) **Left Arm forward and upward—Raise.** "*Raise.*"

Raise the left arm steadily as ordered without altering the position of the body more than is absolutely necessary.

"Lower."

Lower the arm to the starting position.

Has also a lateral and oblique effect on the abdominal muscles.

14. (Attention.) **On the Hands and Knees—Down.** (Plate 30, Fig. 72, *a* to *c*.) "*One.*"

As for "*One*," para. 7, above.

"Two."

Keeping the arms straight, shoot the legs backward, with the knees bent and together until they are directly under the hips and the weight of the body carried on the hands, knees, and ball of the feet.

"Three."

Stretch the toes.

C.F.—(1) Knees not under the hips. (2) Weight not evenly distributed between the hands and knees.

A starting position for *lateral* exercises. In the early stages the starting position should be taken with the knees apart, thereby increasing the base.

15. (On the Hands and Feet on ground.) **On the Feet—Up.**

As for para. 8, above.

16. (On the Hands on ground.) **Foot placing forward.** “*One.*”

Keeping the arms and trunk straight, bend the knee and bring the foot up just outside the arm.

“*Two.*”

Resume the starting position by straightening the leg.

C.F.—(1) Bending the rear knee. (2) Raising the seat.

17. (On the Hands on ground.) **Feet placing forward.** (Plate 38, Fig. 89.) “*One.*”

As for para. 15, above, bringing both knees up at the same time.

“*Two.*”

Resume the starting position, by straightening the legs.

C.F.—(1) Allowing the head to drop. (2) Bending the arms. (3) Obtaining assistance by a preliminary push from the ground by bending and straightening the legs.

18. (In front of wall bars.) **On the top bar—Up.** “*Up.*”

Placing the left hand and right foot on the highest bars that can be reached, and grasping firmly with the hand, seize the top bar with the right hand, little finger close to the left partition board, turning about in doing so, and grasping the other end of the same bar with the left hand with overgr. The body should then be hanging from the top bar with overgr., head, shoulders, seat, legs, and heels, all touching the bars, toes together and pointed.

On the Feet—Down. “*Down.*”

Swing the legs forward, keeping them straight, push slightly from the back, let go the bar, and alight on the ground as usual, swinging the arms downward to the sides.

Used as a starting position for *Knee* and *Leg raisings*. The method of obtaining the position is here described in detail; it should, however, be taken as quickly and smartly as possible and with considerable freedom of movement.

19. (Back against wall bars, stretch height, grasp.) **Left (Right) Knee raising, Leg stretching and Lowering.** “*Begin*” or “*One.*”

Bend the left knee and raise it upward until the thigh is at right angles to the body. Stretch the leg and lower to the ground.

"Two."

Repeat with the right leg.

C.F.—(1) Lower leg not vertical. (2) Breathing restricted.
(3) Allowing the leg to drop before it is fully stretched.

This exercise should be performed with rhythm in normal breathing time. The bars should be grasped so that the ground can just be touched with the ball of the foot.

20. (On the top bar.) **Left (Right) Knee raising, stretching, and lowering.** (Plate 39, Fig. 90.) *"Begin."*

As for para. 19, above.

C.F.—As for para. 19, above, and (4) Allowing the hanging leg to swing from the wall bars.

21. (Overgr. wall bar or beam.) **Left Knee—Raise.** (Plate 39, Fig. 91, b.) *"Raise."*

Bend the left knee and raise it upward until the thigh is at right angles to the body and the lower leg hanging straight downward with the toe pointing to the ground.

Knee—Lower. *"Lower."*

Lower the leg to its original position.

C.F.—(1) Lower leg not vertical. (2) Breathing restricted.
(3) Head not kept back.

22. (Overgr., K. r.) **Leg Forward—Stretch.** (Plate 39, Fig. 91, d.) *"Stretch."*

Keeping the thigh raised, stretch the leg and foot forward in line with it.

Knee—Bend. *"Bend."*

Bend the knee to K. r. position.

C.F.—(1) Breathing restricted. (2) Head not kept back.

23. (Overgr., wall bar or beam.) **Knees—Raise.** (Plate 39, Figs. 91, c and 92, b.) *"Raise."*

Raise both knees as for para. 21, above.

(Knees)—Lower. *"Lower."*

Lower both knees.

The knees may occasionally be raised as high as possible, on the word, *Full knees raise.*

C.F.—As for para. 21, above.

24. (Overgr., Ks. r.) **Left (Right) Leg (Legs) forward—Stretch.** *"Stretch."*

Stretch one or both legs as for para. 22, above.

Knees—Bend. “*Bend.*”

Bend one or both knees.

C.F.—As for para. 22, above.

25. (Overgr., wall bar or beam.) **Legs raising.** (Plate 39, Figs. 91, *e* and 92, *d.*) “*One.*”

Keeping the knees straight and toes pointed, raise the legs to a horizontal position.

“*Two.*”

Lower the legs to their original position.

C.F.—(1) Breathing restricted. (2) Head not kept back.

26. (Overgr., wall bar or beam.) **Knees full raising.** (Plate 39, Fig. 91, *f.*) “*Begin.*”

As for para. 23, above, except the knees are raised as high as possible.

C.F.—As for para. 23, above.

27. **Lying on the Back—Down**, also (with **Arms sideways or upward stretch**). (Plate 40, Fig. 93.) “*Down.*”

As for *Sitting on ground*, para. 4, above, but continue by lowering the body backward to the ground. The body should thus be stretched flat on the back, feet together, toes pointed, arms to the sides (sideways or upward as ordered), palms of the hands on the ground.

Used as a starting position for *Legs raising*, and *Trunk raising* and *Forward reaching*. In the *Arms upward stretch* position, the palms of the hands should be turned inwards, with the thumbs on the ground.

On the Feet—Up. (Plate 41, Fig. 99.) “*Up.*”

Pressing sharply on the ground with the elbows and hands and drawing the feet in, spring smartly to *Attention*.

If the command is given when lying in the *A. upw. str.* position, the arms should be swung forward and downward to the ground in executing this movement.

28. (Lying on the Back (Palms of Hands on ground).) **Knees raise.** “*Raise.*”

Raise the knees, keeping the lower part of the legs parallel with the ground.

“*Lower.*”

Resume the starting position.

Knees full raise.

As above, raising the knees as far as possible.

C.F.—(1) Not keeping the lower part of the legs sufficiently high. (2) Hollowing the back. (3) Restricting the breathing. (4) Not pointing the toes.

No assistance should be obtained from the arms or palms of hands.

29. (Lying on the Back, A. upw. str., or N. r.) **Left Leg raise. (Legs raising.)** (Plate 41, Fig. 98.) "*One.*"

Keeping the knees straight and the toes pointed, raise the leg or legs steadily to an angle of 45° , without raising the seat from the ground.

"*Two.*"

Lower the leg or legs steadily to the ground.

C.F.—(1) Breathing restricted. (2) Knees bent. (3) Back hollowed.

30. (Lying on the Back, A. sidew. str.) **Trunk raising and forward reaching.** "*Begin.*"

Raise the body assisted by the arms, reaching forward as far as possible, and return to the starting position.

C.F.—(1) Not making use of the hands. (2) Allowing the legs to rise from the ground. (3) Lack of effort in the forward movement.

This exercise should be performed in a free and rhythmical manner.

31. (Lying on the Back, A. upw. str., K. r., Feet on floor.) **Leg stretching and Trunk raising to forward reach.** (Plate 40, Fig. 94.) "*Begin.*"

Raise the body by swinging the arms forward, at the same time stretch the legs and reach as far forward as possible with the hands and return to the starting position.

C.F.—As for para. 30, above, and (4) Not making full use of the arms.

32. (Lying on the Back, A. upw. str.) **Trunk raising to forward reach and stretching upward, with Arms raising sideways (alternately).** (Plate 40, Fig. 95.) "*Begin.*"

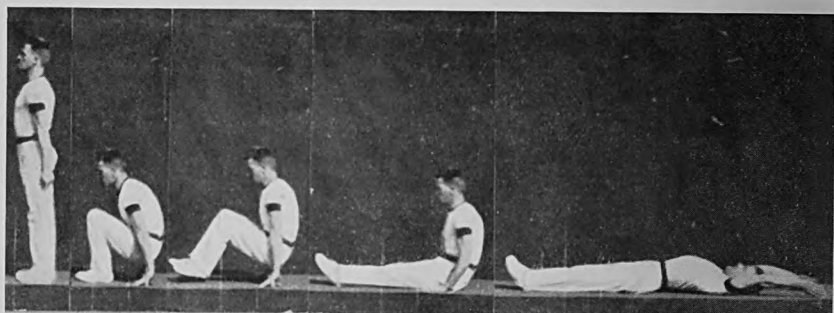
Raise the body and *Forward reach* as in para. 30, above.

Stretch the trunk upward to the sitting position and fling the arms to *Sideways stretch*. Bend forward to the *Forward reach*, and resume the starting position.

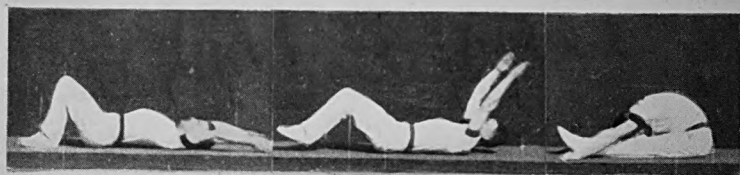
C.F.—As for para. 30, above, and (4) Body not erect in the sitting position. (5) No effort in the arm movements. (6) Arms allowed to drop in the sideways stretch position.

PLATE 40.

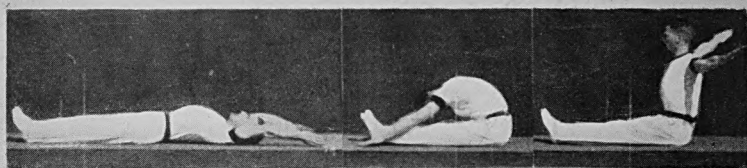
Abd. Ex.



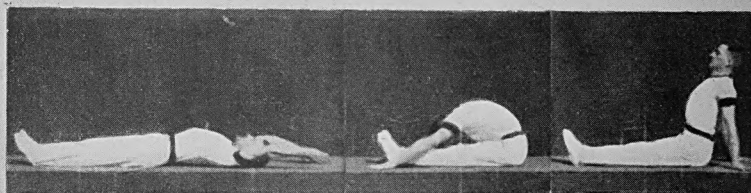
a. b. c. d. e.
Fig. 93



a. b. c.
Fig. 94



a. b. c.
Fig. 95



a. b. c.
Fig. 96

33. (Lying on the Back.) **Trunk raising to forward reach and stretching upward with hands placing backward** (alternately). (Plate 40, Fig. 96.) "*Begin.*"

Raise the body and *Forward reach* as in para. 30, above.

Stretch the trunk upward and place the hands, back behind the seat; arms straight, and a little more than the width of the shoulders apart, and bend the trunk backward. Resume the forward reach position and then return to the starting position.

C.F.—As for paras. 30 and 32, above, and (7) Arms not kept straight. (8) Hands too wide apart.

34. (Lying on the Back, A. upw. str.) **Trunk raising and floor beat.** (Plate 41, Fig. 97.) "*Begin.*"

Raise the body, keeping the legs straight and heels on ground, reach forward as far as possible, beat the floor with the palms of the hands, outside the feet, and resume to the starting position.

C.F.—(1) Allowing the heels to come off the floor. (2) Bending the knees. (3) Forcing the head back. (4) No effort in the forward reach.

35. (Lying on the Back, A. upw. str., or A. sidew. str., or N. rest.) **Trunk raising to forward reach and Legs raising** (alternately). (Plate 41, Figs. 97 and 98.) "*Begin.*"

Raise the body and *Forward reach* as in para. 30, above. Resume to starting position and raise the legs as in para. 29, above, and lower them. Continue alternately.

C.F.—As for para. 30, above, and not allowing the trunk to assume the lying position, before the legs are raised, and *vice versa*.

41. DORSAL EXERCISES

1. The Dorsal exercises bring into play and develop the whole of the extensors of the spine, from the sacrum and pelvis to the skull.

These muscles are specially employed in holding the spine erect, and are thus of particular importance in correcting and maintaining the carriage of the body and head. When the body is bent or inclined forward, as is the case in so many of the movements and positions assumed in daily life, it is these muscles which prevent it from falling forward; they are therefore constantly in use, and the work thrown on them is considerable.

The correct carriage of the spinal column being a matter of importance, particular attention should be paid to developing

the dorsal muscles, which play such a prominent part in its carriage and movement.

Many exercises of this group also have a strong effect on those muscles at the back of the thigh which are attached to the pelvis. If these muscles are too weak, as is often the case, they tend to alter the inclination of the pelvis, and consequently have an injurious effect on the carriage (Sec. 67, 2).

2. (F. sidw. pl., or F. astr., or Hl. together, or F. forw. pl., and H. f., or A. b., or A. upw. str.) **Trunk bending forward.** (Plate 42, Fig. 100.) "*One*" or "*Begin.*"

Incline the trunk slowly forward from the hips, at an angle of about 45° to the upright position, by moving the seat to the rear, keeping the back and legs straight, the chest advanced and the head in the same relative position as at *Attention*.

"*Two.*"

Slowly resume the starting position.

C.F.—(1) Head or chin poked forward. (2) Back rounded.
(3) Knees bent.

3. (F. astr., H.f.) **Trunk bending downward.** (Plate 42, Fig. 100, c.) "*Begin.*"

Passing through the *Trunk forward bend* position, continue the movement quickly downward as far as possible, and rebound to the *Trunk forward bend* position.

C.F.—As for para. 2, above.

4. (F. astr., Tr. forw. b.) **Floor beat with Knees straight.** (Plate 43, Fig. 103.) "*Begin.*"

As for para. 3, above, on the downward movement, beating the floor with the palms of the hands between the feet.

C.F.—Knees bent.

This exercise has a good stretching effect on the hamstrings, and helps to give freedom of movement to the hip joints.

5. (F. astr.) **Floor beat and Trunk stretching forward with Neck rest.** (Plate 42, Fig. 101.) "*Begin.*"

As for para. 4, above, on the rebound to the *Trunk forward bend* position carry the hands in a circular movement to the *Neck rest* position (Sec. 35, 3); on the floor beat from this position carry the hands over the head and downward in a sweeping movement.

C.F.—(1) Jerky movement. (2) No effort in the floor beat.
(3) Not retaining the trunk forward bend position.

6. (F. astr., A. forw. b.) **Trunk forward bend, Arms flinging.** (Plate 42, Fig. 102.) "*Begin.*"

As for para. 2, above, and Sec. 35, 29.

C.F.—As for para. 2, above, and Sec. 35, 29, and (6) Not retaining the forward bend position.

7. (F. satr., A. upw. str.) **Trunk forward bend, Arms swinging downward and sideways.** (Plate 43, Fig. 104.) "*Begin.*"

As for para. 2, above, and the arms swung downward in front of the body to the sideways stretch position, Sec. 35, 8.

C.F.—Not retaining the forward bend position.

8. (Attention.) **Trunk forward bend, Arms swinging backward, forward, and upward.** (Plate 47, Fig. 116.) "*Begin.*"

Without altering the position of the body, swing the arms (back of the hands upward) backward, forward, and upward in a free rhythmical movement, allowing them to rebound each time to the backward position.

C.F.—(1) Not fixing the body in the forward bend position.

(2) Jerking the arm movement. (3) Arms too rigid.

9. (F. astr., Tr. forw. b.) **Floor beat with Arms swinging backward, forward, and upward.** "*Begin.*"

As for para. 8, above; before swinging the arms backward, beat the floor with the palms of the hands as in para. 4, above.

C.F.—As for paras. 8 and 4, above.

10. (F. astr., H. F.) **Trunk bending backward.** "*Begin.*"

Keeping the body well braced up, incline it steadily backward as far as required.

C.F.—(1) Back rounded. (2) Head poked forward. (3) Breathing restricted.

This exercise must be restricted to the dorsal part of the back only, and care should be taken that the bend backward does not take place in the lumbar regions, which tends to create a hollow back.

11. (Facing bench.) **Forward lying—Down.** (Plate 44, Figs. 105, 106 and 107.) "*Down.*"

Bend quickly forward and place the hands on the ground on the far side of the bench, steadying the body, whilst doing so, by taking its weight with one hand on the bench. The body and legs straight, heels together, arms straight and at right angles to the body, the centre of the thighs resting on the bench.

On the Feet—Up. (Plate 46, Figs. 114 and 115.) “*Up.*”

Resume the starting position as quickly as possible.

“*Forward lying*” on bench is used, with *Feet support*, as starting position for *Trunk bending backward* and *Trunk bending forward*, etc.

Feet support may be taken at the wall bars, with both feet inserted between two of the bars at the required height or with living support as described under “*Class Arrangements*” (Sec. 31, 2).

12. (Forw. lying, F. support.) **Hips—Firm.** (Plate 45, Fig. 108.) “*Firm.*”

As for Sec. 35, 2.

Arms—Bend. (Plate 45, Fig. 109.) “*Bend.*”

As for Sec. 35, 5.

Arms raising upward. (Plate 45, Fig. 110.) “*Raise.*”

Raise the arms slowly to the *Upward stretch* position without altering the position of the body.

Hands—Support. (Plate 46, Fig. 114.) “*Support.*”

Resume the *Forward lying* position with hands on ground.

13. (Forw. lying, F. support and H. f., or A. b., or A. upw. str.) **Trunk bending backward or Trunk backward—Bend.** (Plate 45, Fig. 111.) “*One*” or “*Bend.*”

Bend the upper part of the trunk slowly backward, the head commencing the movement and well kept back with the chin drawn in. The bending should *not* be made from the waist alone, but the whole spine should be arched.

Trunk forward—Stretch. “*Two*” or “*Stretch.*”

Resume the starting position by reversing the above movement.

C.F.—(1) Small of the back unduly hollowed. (2) Poking the head and chin forward. (3) Breathing restricted.

The following may be added in the A. b. pos.: **Arms stretching sideways. Arms stretching upward.**

This is a typical *Dorsal* exercise in the fullest meaning of the term and is capable of producing the best and strongest effects of the group

14. (Forw. lying, F. support and H. f., or A. b., or A. upw. str.) **Trunk bending forward or Trunk forward—Bend.** (Plate 46, Fig. 112.) “*One*” or “*Bend.*”

Incline the trunk slowly forward from the hips, keeping the back straight, the chest advanced and the head in the same relative position as at *Attention*.

Trunk forward—Stretch. “*Two*” or “*Stretch.*”

Slowly resume the starting position.

The following may be added in the A. b. pos. : **Arms stretching sideways.** (Plate 46, Fig. 113.)

15. (On ground.) **Forward lying—Down.** (Plate 48, Fig. 118, *a* to *e.*) “*Down.*”

Passing quickly through the position of *On the hands, Arms bend* (Sec. 40, 9), lie flat on the ground face downward, and stretch the arms sideways, placing the palms on the ground.

On the Feet—Up. “*Up.*”

Reversing the above movement, spring smartly to *Attention.*

“Forward lying” on ground, with *Feet support*, is used as starting position for *Trunk bending backward.*

16. (Lying Face downward, A. sidew. str.) **Trunk raising.** (Plate 48, Fig. 118, *f.*) “*Begin.*”

As for para. 13, above, keeping the arms in the *Sideways stretch* position.

C.F.—As for para. 13, above, and (4) Arms not retaining the A. sidew. st. position.

This exercise should be done in normal breathing time.

17. (F. full o.) **Forward lunging with Arms swinging upward.** “*Begin.*”

As for Sec. 33, 22.

At the same time swing the arms to the *Arms upward stretch* position and swing them down on resuming the starting position.

C.F.—As for Sec. 33, 22, and (3) Bad co-ordination.

18. (Sit. pos., L. straight, Feet grasp.) **Trunk bending downward.** (Plate 48, Fig. 119.) “*Begin*” or “*One.*”

By bending the arms pull the body forward and downward as far as possible.

“*Two.*”

Resume the starting position.

C.F.—(1) No movements in the lumbar regions of the back.
(2) Bending the knees.

This exercise has a good stretching effect on the hamstrings, also on the dorsal group of muscles of the back. It also gives movement to the lumbar vertebræ of the spine.

19. (Attention.) **Trunk bending downward and upward to Arms bend position** (quickly). (Plate 48, Fig. 120.) "*Begin.*"

Swing the body downward as far as possible, keeping the knees straight and beat the floor with the palms of the hands. Allow the body to rebound to the upright position and at the same time bring the arms to the *Arms bend* position.

If the floor can be easily beat with the knees straight, the arms should be bent so as to allow for the full bend downward of the body. No pause should be made in the downward bend position, but a slight one in the upright position of each beat.

C.F.—(1) No control. (2) Not assuming the upright position after each bend downward. (3) Not keeping the knees straight. (4) Pushing up with the hands.

20. (Kneeling, sitting on Heels, Hands clasped behind Back, Forehead on Knees.) **Back stretching.** (Plate 47, Fig. 117.) "*Begin*" or "*One.*"

Stretch the body forward and upward slowly from the hips without moving the relative position of the pelvis. Pull the shoulders back by stretching the arms backward, also raise the head to the head backward bend position.

"*Two.*"

Resume the starting position by slowly relaxing all the muscles employed.

C.F.—(1) Raising the body by moving the pelvis. (2) No effort in the exercise. (3) Not pulling the shoulders back.

21. (In pairs standing.) **Fireman's lift.** "*Begin.*"

Pass the right (left) arm between the subject's legs, bend down and allow the subject to fall across the back, grasp his right (left) arm which should be hanging over the left (right) shoulder. Lift the subject and see that he is balanced across the back.

C.F.—(1) Not having the subject properly balanced across the back. (2) Not having one hand free.

The subject should hang limp and give no assistance to the carrier.

22. (In pairs, subject prone.) **Fireman's lift.** "*Begin.*"

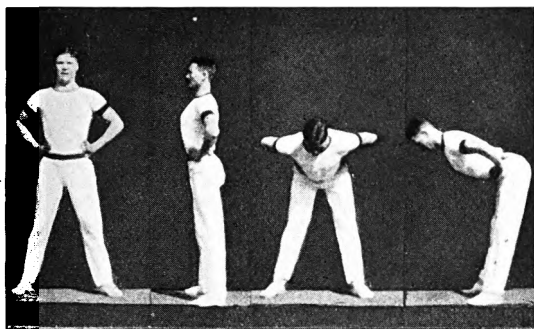
Turn the subject face downward, cross his feet, and lift the trunk to the *sitting on heels* position, bend down and proceed as in para. 21, above.

This is a very strong exercise, and the subject should not be allowed to assist in any way and should be perfectly limp the whole time.

A good emergency method of carrying wounded, single-handed.

PLATE 42.

Dor. Ex.

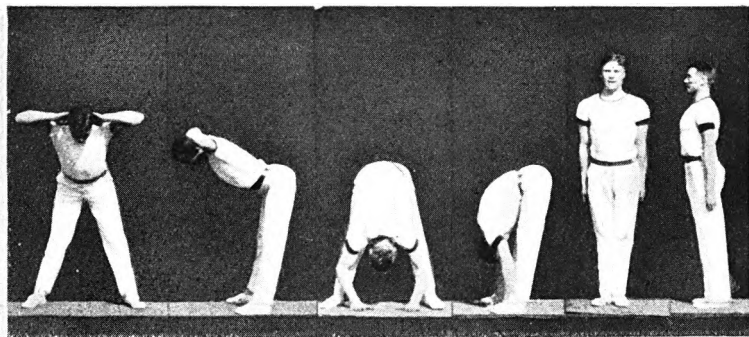
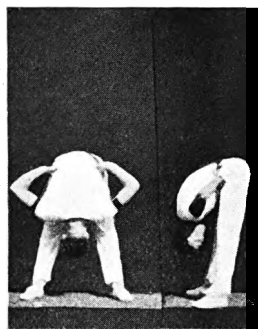


a.

b.

c.

Fig. 100.

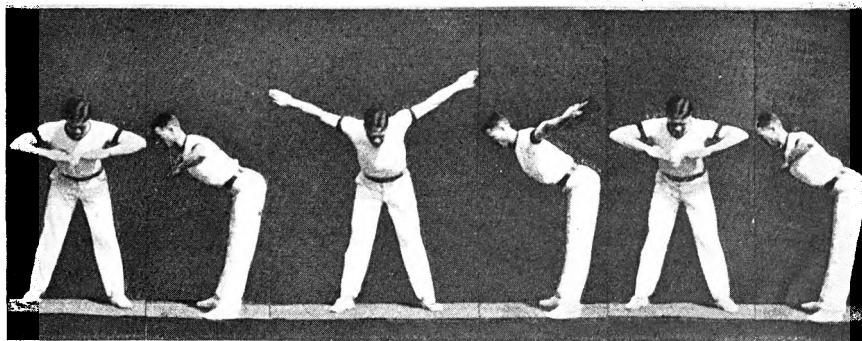


c.

b.

a.

Fig. 101



a.

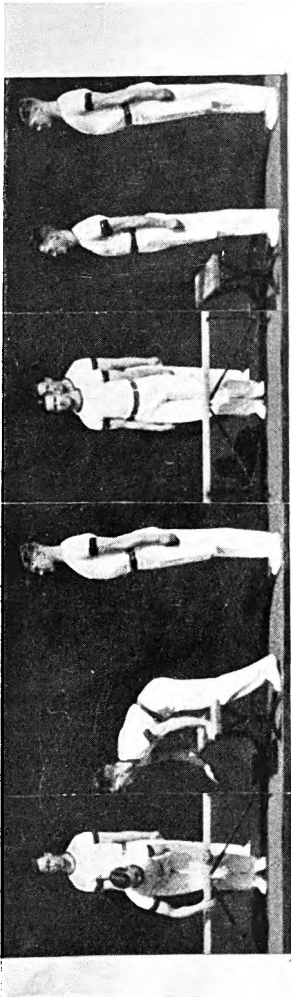
b.

c.

Fig. 102.

PLATE 44.

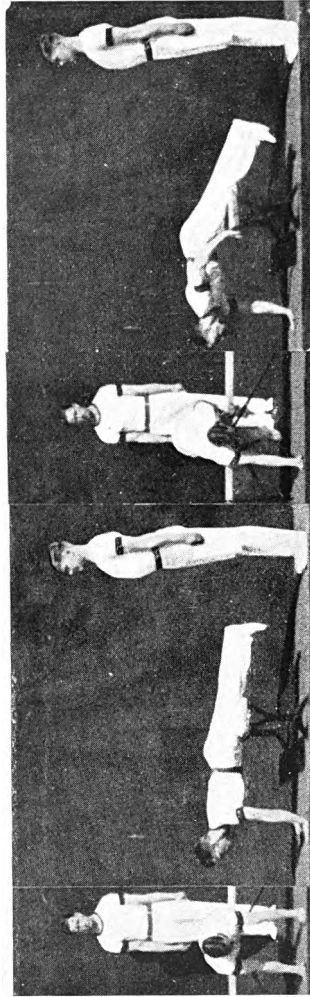
Dor. Ex.



a

b

Fig. 105



c

d

PLATE 45.

Dor. Ex.

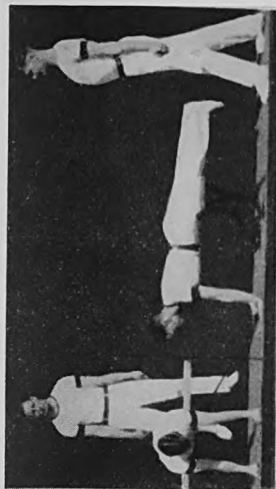


Fig. 106



Fig. 108



Fig. 110

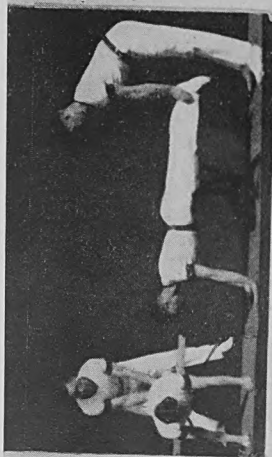


Fig. 107

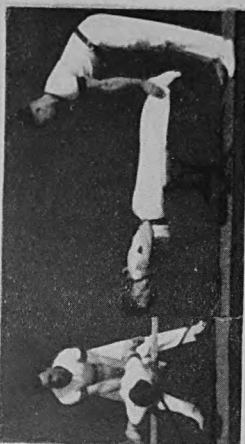


Fig. 109



Fig. 111

PLATE 46.

Dor. Ex.

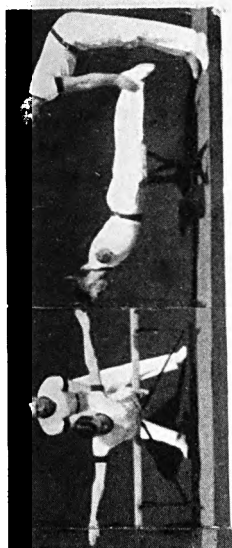


Fig. 113

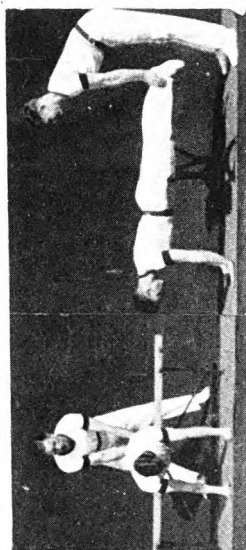


Fig. 112

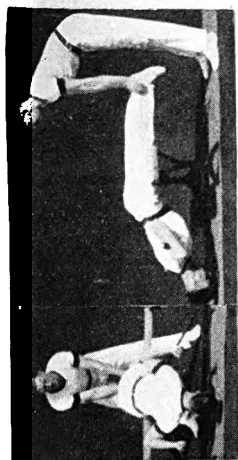
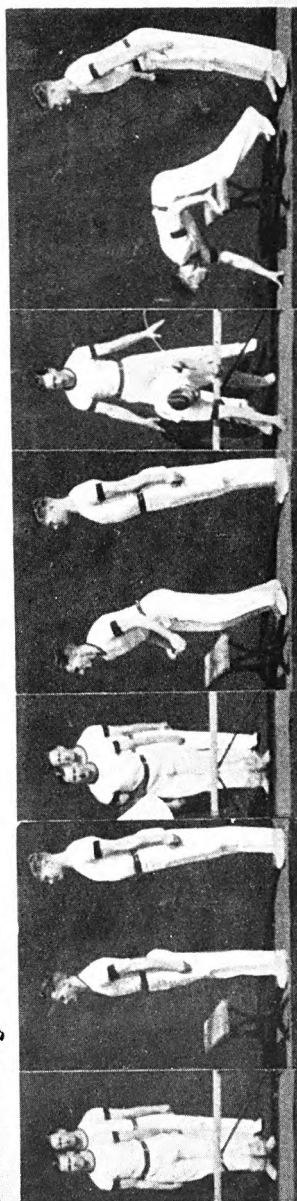


Fig. 114



a

b

c

Fig. 115

42. AGILITY EXERCISES

(General Remarks for Secs. 43 to 45)

1. The exercises of these groups are of a bold, active, and vigorous character ; they engender habits of activity, dash, and energy, develop confidence and a consciousness of power, and, as they require determination and pluck for their execution, are invaluable in the training of a soldier.

Each exercise consists of several movements, following one another in a harmonious succession, each movement requiring due regulation as regards time, strength, and rapidity. Co-ordination of the muscles, control of the body, alertness and agility are thus acquired.

Jumping exercises are those performed without the assistance of the hands and arms. *Vaulting* is the term applied to those exercises in which the hands and arms are used for supporting the weight of the body on some apparatus during their execution.

2. All jumping and vaulting exercises consist of three parts, in addition to the preliminary run which is used in many of them, viz. :—

(i) The “take off.” (ii) The actual jump or vault. (iii) The “landing.”

3. The “take off” can either be from one foot as in the high and long jumps, or from both feet as in most vaults. It is made up of a quick bending, followed by an immediate and powerful stretching of the hip, knee and ankle joints, and in training should always be taken from the fore part of the feet (otherwise the required lightness will not be obtained), but without any stiffness of the ankle.

The distance in front of the obstacle at which a man should “take off” must vary with the height which is to be cleared. It is, however, a matter of judgment, and cannot be definitely laid down. The instructor must therefore watch the men carefully and tell them if they make the mistake of “taking off” too near when jumping a rope, etc.

In all jumping off one foot, the left and right foot must be used alternately. In “taking off” from one foot the jump is as it were a continuation of the run, but in jumping off both feet the last pace of the run consists of a sort of preparatory jump, taken with the object of bringing both feet together for the spring. This preparatory jump should be short and quick so as to reserve as much of the power as possible for the actual jump or vault.

The use of a spring-board should be avoided, as it prevents a man from developing his own springing powers, and makes him trust to the spring-board for the spring.

4. The *jump* itself commences as the feet leave the ground, and finishes at the instant they again touch it. Just before the feet meet the ground at the end of the jump or vault the body should be fully stretched, although at the moment of landing the legs should be free from stiffness and ready to bend at once.
5. In "*landing*" the toes must meet the ground first, and the fall of the body should be broken evenly by a "giving" of the ankle, knee and hip joints at the moment of impact. If this is badly timed the landing becomes "heavy." The knees should be fully bent and kept well out, the feet at the normal foot-angle, heels together and raised, arms at the sides, trunk vertical and head erect. The knees should then be straightened nearly as quickly as they were bent, lowering the heels at the same time.

The body during the landing should be in full balance so that the position of *Attention* may be assumed correctly before moving off. The legs should work like a spring, at first compressed by the weight on landing and then extended for the recovery. When the balance cannot be maintained after the bending of the knees, a pace forward should be taken as the legs are being stretched; jumping forward with the knees bent to regain the balance must be discouraged.

When an exercise is performed in quick succession the first forward pace will be taken as the legs are straightened.

It is essential that a correct method of landing should be acquired, as it is in the landing that accidents are likely to occur owing to faulty method.

"Knees full bending" is an excellent exercise for improving the "landing," and should be constantly practised.

6. *The run*.—Most of the jumps require a forward movement which necessitates a run. The "take off" supplies the upward movement and *the run* the forward movement. The run is commenced from the position of *Attention* by raising the heels, a few paces forward are then taken, the paces being regulated so that the required foot shall be in front at the "take off" and the speed increased (never checked) at the end of the run to obtain the necessary impetus.

In the early stages of training the run should not exceed three paces and should be commenced with the foot from which it is intended to jump. Being started at a fixed distance from the obstacle, it prepares men to gauge their stride correctly when approaching a jump with a longer run.

7. The above remarks apply generally to jumps of moderate height and limited length for training purposes in a gymnasium. In jumping greater heights and longer distances the

principles should be the same, but the movements may be taken more freely according to individual requirements. But it should be noted that when jumping *height* the run should be short, and when jumping *length* the run should be long enough to obtain topmost speed at the "take off" in order to gain the necessary forward impetus.

43. JUMPING AND VAULTING (Free Standing and Apparatus)

(General Remarks, *see* Sec. 42)

1. Upward jumping. (Plate 49, Fig. 121.) "One."

Hl. r.

"Two."

K. b.

"Three."

Spring quickly from the ground vertically upward, at the same time fully extending the body and legs, keeping the arms straight at the sides, drop to the ground from the jump on to the toes with the knees straight but not stiff, landing in the manner described in Sec. 42, 5.

Or "Jump."

As above, but judging the time.

C.F.—(1) Not stretching sufficiently in the jump. (2) Landing too heavily. (3) Hollowing the back.

This and all the free standing jumps are at first taken by numbers, in order that the separate movements may be learned and control may be obtained. To gain further control it is often useful to give a longer or shorter pause between each word of command and movement when jumping by numbers. But the important part of these exercises is to learn the exact timing of the motions in taking the spring; this can only be effected by performing the exercises "judging the time."

Two or more jumps may be taken in quick succession by making use of the landing position of one jump for obtaining the spring for the next.

2. Upward jumping with turning to the left. (Plate 50, Fig. 123.) "One" or "Jump."

Hl. r.

"Two."

K. b.

"Three."

Jump upward as for para. 1, above, turning in the air to the left.

C.F.—As for para. 1, above, and (4) Commencing the turning in the K. b. position.

3. Upward jumping with Arms raising sideways. "*One*" or "*Jump.*"

Hl. r.

"*Two.*"

K. b.

"*Three.*"

Jump upward as for para. 1, above, raising the arms sideways while rising from the ground and lowering them to the sides while descending.

C.F.—As for para. 1, above, and (4) Raising the arms too high.

4. Upward jumping with Arms swinging upward. "*One*" or "*Jump.*"

Hl. r.

"*Two.*"

K. b.

"*Three.*"

As for para. 1, above, swinging the arms upward while rising and downward while descending.

C.F.—As for para. 1, above, and (4) Bending the arms.
(5) Lowering the arms too soon.

5. Forward jumping with Arms raising forward. (Plate 50, Fig. 124.) "*One*" or "*Jump.*"

Hl. r.

"*Two.*"

Bend the knees and incline the body slightly forward.

"*Three.*"

Jump as for para. 1, above, but forward, and raise the arms to the forward raise position, and lowering the arms to the sides when descending.

C.F.—As for para. 1, above, and (4) Jumping too far forward. (5) Raising the arms too high.

This exercise is not performed with the object of jumping as far forward as possible, but for correctness of style.

6. Jumping backward. (Plate 49, Fig. 122.) "*One*" or "*Jump.*"

Raise the heels, bringing the arms parallel to the front of the body.

"*Two.*"

Bend the knees slightly, at the same time swinging the arms to the rear.

Jump backward, inclining the body forward.

C.F.—Imperfect co-ordination of legs and arms.

This exercise is to be performed more for co-ordination and agility than for distance.

7. With one (three) paces forward off the left Foot—Jump. (Plate 51, Fig. 125.) "*Jump.*"

Raise the heels and then take one (or three) paces forward on the toes, commencing with the left foot, swinging the right leg forward, with the knee straight, jump upward and forward off the left foot, the legs to be brought together and the body fully stretched immediately after the "take off," the arms to be kept at the sides throughout the jump; land as in Sec. 42, 5.

C.F.—(1) Forward knee bent. (2) Insufficient stretch of the body.

Correctness of style should be aimed at and not the covering of a long distance. The "taking off" pace should always be taken quicker than the other paces to work up for the spring.

8. With turning to the left one (three) paces forward off the left Foot—Jump. "*Jump.*"

As for para. 7, above, but turning in the air to the left.

C.F.—As for para. 7, above.

9. Long jumping (over two chalked lines). With three paces forward off the left Foot—Jump. "*Jump.*"

Jump, with three paces run, as in para. 7, above, but raising the knees and feet sufficiently high to clear the space between the "two chalk lines," assisting the spring by a "free" upward swing of the arms which should, however, be again brought to the sides as the toes meet the ground; land as in Sec. 42, 5.

C.F.—(1) Taking off too far away from the first line. (2) Not rising quite high enough to get the required length.

This is a useful preparation for jumping longer distances, correctness of style being aimed at and not length of jump. The chalk lines on the floor should be about two paces apart. In the "take off" the toe should be just short of the first line, and in the "landing" the feet should be just clear of the second. As the style improves this jumping should be practised in the open on prepared ground, over ditches, etc., and the distances increased.

Note.—This should also be taken "free" off either foot.

10. (From bench, etc.) **Downward jumping** (off the left or right foot.) "*Jump.*"

Swinging the left leg forward with the knee straight, jump forward and downward off the right foot, keeping the arms to the sides, stretching the body in the air and landing in the usual manner.

No attempt should be made when jumping from a considerable height to increase the drop by jumping upward, but rather the other way, e.g., the body should be, as it were, let down easily by well bending the taking off leg before actually taking off.

11. **Stride jumping with Arm movements.** "*Begin.*"

Part the feet to the front and rear, at the same time swinging the arms forward and backward, the left (right) arm moving forward (backward) with the right (left) leg. The spring being taken from the ankle joints.

"*Halt.*"

Resume the position of *Attention*.

C.F.—(1) Not parting the legs far enough. (2) Not keeping upon the toes.

12. **Jumping over rope. With three paces forward off the left foot—Jump.** (Plate 52, Fig. 127.) "*Jump.*"

Jump, with three paces run, as before described, but raising the knees and feet sufficiently high to clear the rope and assisting the spring by a "free" upward swing of the arms which should, however, be again brought to the sides as the toes meet the ground in landing.

C.F.—(1) Taking off too far away from the rope. (2) Making the movement too stiff and heavy. (3) Insufficient stretch before landing.

The rope should at first be quite low, correctness of style being aimed at rather than height. The jumping should be just high enough to clear the rope easily and no more. As style, lightness, and control are acquired the rope should be raised, and various styles of high jumping introduced at a jumping pit.

Note.—This should also be taken "free" off either foot.

13. (One pace from and side towards rope.) **Jumping over rope with oblique run.** "*Jump.*"

Take a pace forward with the foot that is nearest the rope, then a pace forward with the other foot, and, taking a spring from the ground, swing the first leg over the rope, followed by the other, at the same time raising the arms forward in line with the shoulders and inclining the trunk slightly forward; land on the other side of the rope on the toes of the first foot

and then on the toes of the second foot, continuing to move forward in quick time.

C.F.—(1) Not continuing to move forward while jumping and landing. (2) Making the movements too stiff and heavy. This exercise should not be taken until a thoroughly good style of jumping with a straight run has been acquired.

14. **Running stride jump.** “Go.”

Raise the heels, run up to the given mark and take off with one foot, landing on the opposite foot.

C.F.—(1) Not sufficient speed. (2) Not getting high enough. (3) Not bracing back the leg from which the “take off” was made. (4) Back rounded.

If performed from one mat to another, a rope or mark should be placed on the centre of the second mat in order that the performer does not injure his ankle on the edge of this mat.

If performed in a gymnasium, height rather than distance should be aimed at.

15. (Beam grasp [see Sec. 37, 2].) “**First Position.**” (Plate 35, Fig 81, *a* to *c*.) “One” or “Up.”

Retaining the grasp of the beam with the hands, take a short preparatory jump forward off both feet and remain with the knees bent ready to spring upward.

“Two.”

Spring up to the position, viz. arms straight, hands the width of the shoulders apart, trunk supported above the bar by the arms, shoulders down, spine fully stretched, front of the thighs resting against the beam, legs straight, toes pointed, head and feet slightly drawn back showing an even curve from head to heels with the body pressed well up between the arms.

C.F.—(1) Shoulders not pressed down. (2) Back rounded and chest flattened. (3) Legs allowed to fall forward.

Used as a starting position for many vaults, it is also used very frequently as an intermediate position between other exercises on the horizontal bar in recreational gymnastics.

In *Upward circling* with *Undergr.* and some other exercises the same position is obtained, but with the fingers to the rear and thumbs to the front, and should it be required (as is sometimes the case) to take the position with the fingers to the rear in this way, the men should be ordered to “reverse the hands.”

16. (First position). **On the Feet—Down.** (Plate 35, Fig. 81, *j* to *n*.) “One” or “Down.”

Swing the legs forward keeping the knees straight.

"Two."

Swing the legs backward from the hip joint and at the same time push the body backward from the beam and alight on the toes on the ground a short pace from the beam, bending the knees to break the fall as before described and retaining the grasp of the beam with the hands.

17. (First pos., or beam grasp, or with run.) **Vault to left with Foot assisting.** (Plate 52, Fig. 128.) "*One*" or "*Vault*."

Raise the left leg sideways and place the inside of the foot on the beam.

"Two."

Lean the body forward over the beam, raise the right leg and pass it over the beam inside the left foot, quitting the grasp with the left hand, and then with the right, and land as in Sec. 42, 5, but on the opposite side of the beam and facing away from it.

C.F.—(1) The assisting leg not kept straight. (2) Not raising the leg with the upward movement (when performed with a run).

This is the simplest and easiest kind of vault, and, when taken "free," it is one of the most practical methods of surmounting in the field a low wall or railing of moderate height.

Note.—When taken from the *Beam grasp pos.*, or *With a run*, the position with the foot on the beam should be taken direct from the upward spring. It should usually be practised "free."

18. (Beam grasp, or First pos., or with run.) **Vault to left.** "*Vault*" or "*Go*."

Take off from both feet, jump up with straight arms and bent knees keeping the back as straight as possible, and swing the body over the apparatus to the left, pivoting on the hands, knees together, toes pointed, changing the position of the hands, left hand first and then the right, and land as in Sec. 42, 5, but facing the apparatus.

C.F.—(1) Not bending the knees sufficiently. (2) Not taking sufficient weight on the arms.

May also be performed over the box-horse.

Note.—When taken from "*First pos.*" the movement is commenced by swinging the legs forward, and completed as described.

19. (Left Hand beam grasp and right F. forw. pl., or with run.) **Left Hand vault.** (Plates 51 and 54, Fig. 126.) "*Vault*" or "*Go*."

Keeping the legs straight, swing the left leg over the apparatus followed by the right, supporting the weight of the body on the left hand, arm straight, at the same time swing the right arm upward to assist the raising of the body; land as in Sec. 42, 5, but on the opposite side of the apparatus and facing away from it.

C.F.—(1) Bending the knees. (2) Jumping off the wrong foot. (3) Allowing the supporting arm to bend.

This is a practical method of surmounting an obstacle (e.g., a stout railing) in the field. The upward swing of the free arm should be made so as to assist the raising of the body over the apparatus or obstacle.

20. (First pos. on upper of two beams, or with run.) **Vault to left** (over double beam.) (Plate 53, Fig. 129.) "*Vault*" or "*Go*."

Reverse the right hand, bend the body forward from the hips, and, placing the left hand on the lower beam vertically under the right, swing the legs over the beam to the left, keeping them straight, transfer the right hand to the lower beam to assist in controlling the body when landing as in Sec. 42, 5, but facing to the right.

C.F.—(1) Not swinging the legs high enough when passing over the beam. (2) Bending the legs.

21. (Side to double beam.) **Heaving jump.** (Plate 54, Fig. 130.) "*Jump*."

Jump off both feet, as far forward as possible to get the required swing, and grasp the upper beam with crossgr., hand furthest from beam in front, bend the arms and swing the legs over the lower beam by bending from the hips, stretching again vigorously in clearing it so that the body is horizontal, let go the beam and land as in Sec. 42, 5, but with side to and nearest hand on the lower beam.

C.F.—(1) Not reaching far enough. (2) Taking off on one foot. (3) Insufficient pull with the arms.

The K. b. pos. of the "*landing*" may be used, if required, for obtaining the spring for a second *Heaving jump* back to the side from which the first jump was started.

22. (Facing double beam, with run.) **Heaving jump.** (Plate 55, Fig. 131.) "*Go*."

Take off from both feet far enough from the beam to just reach it comfortably with the jump, seize the upper beam with overgr. and bent arms, bend the knee and hip joints so as to clear the lower beam, straighten them again sharply and shoot

the body forward with the assistance of the arms, land as in Sec. 42, 5.

C.F.—(1) Taking off too close to the beam. (2) Insufficient pull with the arms. (3) Knees not stretched when clear of lower beam.

23. (Sitting on ground.) Position for hurdling. "Ready."

Carry off one leg at right angles to the body, at the same time bending the knee, allowing the leg to rest on the ground on its inner side. The heel of the rear leg should be behind the body and in line with the hip. The forward leg should be kept straight.

C.F.—(1) Thigh not far enough around. (2) Knee not on the ground. (3) Forward leg not straight.

To increase the effect of this exercise, arm movements can be added, such as *Trunk twist* and *forward reaching* with opposite hand.

24. Hurdling over benches. "Go."

Jump over a series of benches with a straight forward leg and the body well forward.

25. Leap-frog (in pairs.) "Ready."

One of the pair doubles out a few paces and takes up the leap-frog position, i.e., forward lunge position, back slightly arched, head well tucked in, hands resting on the thigh of the forward leg just above the knee, to give support.

"Go."

The other runs forward, jumps off with both feet, places his hands on the back of his leading man, keeping his arms straight opens his legs wide and passes over the back of the leading man and lands in the usual manner; runs forward a few paces and takes up the *"Ready"* position.

C.F.—(1) Back too straight. (2) Head raised. (3) Hands not supporting the body. (4) No dash. (5) Take off too close. (6) Hands not taking the weight. (7) Bad control.

This exercise can be done in a stream, each man advancing after his jump a certain number of paces and getting ready. The last one over should say *"Up"* as he goes over the first man, and then the first man starts, and so on until the command *"Stop"* is given.

26. (Attention.) Hop, Step, and Jump. "Begin."

Run forward a few paces to a mark on the ground, hop on one leg as far as possible, then take a step with the other leg, and

on completing the step as the rear leg is coming forward, jump as far forward as possible landing on both feet.

C.F.—(1) Lack of co-ordination and control. (2) Stride jumping.

To be able to do this exercise well a great deal of control and co-ordination is required. Distance should not be attempted until this co-ordination is acquired.

44. JUMPING AND VAULTING (over Vaulting Horse)

(General Remarks, *see* Sec. 42)

1. All exercises in this group (except those performed from a stationary position on the top of the horse) require a forward movement which necessitates a run. The run is commenced as stated in the notes on *Agility Exercises*, Sec. 42, 6, and its length should be regulated according to the nature of the exercise, and for this purpose the exercises have been divided into two sub-groups :—

Group i. Those which require co-ordination more than dash, should be done with not more than three paces run before the preparatory jump. (Paras. 3 to 19, below.)

Group ii. Those which require dash and co-ordination, the run to be commenced not more than 8 to 10 yards from the horse. (Paras. 20 to 29, below.)

2. In the early stages, exercises over the vaulting horse can be done with a 3 ft. 6 in. horse, but its use should not be longer than is absolutely necessary, and is allowed only to give the beginner a feel of what the exercise is like. Great stress should be laid on the matter of "Take off," especially for those exercises which require a take off well away from the horse. To help beginners to judge their "take off" many aids can be made use of, such as a high jump rope, 2 ft. in front of the horse and 1½ ft. high, or a rolled-up mat in front of the horse, etc. Confidence must be inspired by the instructor and he must know his students ; so that he stands in to save those who are likely to fall. Care should be taken that this is not overdone as it can produce the opposite effect.

3. **On the Feet and off** (top section of horse, broadways). (Plate 56, Fig. 132.) "Go" or "Begin."

Jump off one foot, alighting on the horse with both feet, the heels together and knees slightly bent with the body inclined forward, and then, without any pause, jump upward and

forward, stretching the body in doing so, arms to the sides; land as in Sec. 42, 5.

C.F.—(1) Putting too much pace into the run. (2) Not sufficient height and stretch after leaving the horse. (3) Lack of control when landing.

4. **On the Feet and off with Arms swinging upwards** (top section of horse), (broadways). (Plates 56 and 57, Fig. 133.) "*Go*" or "*Begin*."

As for para. 3, above, swinging the arms forward and upward, while rising from the horse, and forward and downward while descending. The arms to be kept fully stretched, the width of the shoulders apart with the palms of the hands turned inward.

C.F.—As for para. 3, above, and (4) Arms not fully stretched. (5) Swinging the arms downward too soon.

5. **Between the Hands** (Bench covered with gymnasium mat). (Plate 57, Fig. 134.) "*Go*" or "*Begin*."

Jump forward off both feet, well away from the bench, reaching forward, place both hands on the top, the width of the shoulders apart, round the back, bend the legs well under the body so as to clear the bench, keeping the knees and feet together; assist the forward movement by pressing off with the hands; land as in Sec. 42, 5.

C.F.—(1) Not sufficient pace in the run. (2) Taking off too close. (3) Keeping the hands too long on the bench.

A useful exercise for teaching the distance of "take off" required to clear the horse in the more difficult exercises to follow. It is impossible to perform this exercise correctly if the "take off" is too close.

The hands should not touch the bench until after the "take off" and the feet do not pass between the hands, but the hands (assisting the forward movement) should quit the bench before the feet clear it.

6. **On the Knees** (horse broadways). (Plate 58, Fig. 135, *a* and *b*.) "*Go*."

Jump off both feet close to the horse, placing the hands on the top, the width of the shoulders apart, bending the hips and knees so as to raise the latter between the hands to the following position, i.e., legs together, toes pointed, knees to the front and fully bent, shins resting on the top of the horse, insteps touching the rear edge, body and head erect and sitting well back on the heels, arms to the sides.

C.F.—(1) Putting too much pace into the run. (2) Taking off too far from the horse. (3) Over balancing forward.

This exercise and the following exercises, paras. 7 to 29, below, are all performed over the box-horse.

When it is required, as in this exercise, to remain stationary on the horse, the "take off" should be quite close to it and the jump made directly upward rather than forward.

7. On the Knees. Forward jump (horse broadways). (Plate 58, Fig. 135, *b* to *f*.) "*Jump.*"

Spring forward and upward off the insteps, raising the arms freely to the front without stiffness to the level of the shoulders, palms of the hands turned inward so as to assist the spring. Immediately the feet are clear of the horse, stretch the legs, and lower the arms to the sides, land as in Sec. 42, 5.

C.F.—(1) Not sufficient use made with the arms. (2) Not springing high enough. (3) Arms not brought to the sides before landing.

8. On the Feet to Attention (horse broadways). "*Go.*"

Jump off both feet, place the hands on the top of the horse, width of the shoulders apart, bending the hips and knees so as to raise the feet to the top of the horse, between the hands, the knees and feet to be kept together, then immediately straighten the body to the position of *Attention*.

Downward jump. "*Jump.*"

Jump downward as in Sec. 43, 10.

9. On the Feet and off (horse broadways). "*Go*" or "*Begin.*"

Jump off both feet, place the hands on the top of the horse the width of the shoulders apart, keeping the legs together, bend the hips and knees so as to place the feet on top, between the hands, with the body inclined forward, and then without any pause, jump well upward and forward stretching the body with the arms to the sides, land as in Sec. 42, 5.

C.F.—(1) Taking off too close to the horse. (2) Not springing off immediately the feet touch the horse. (3) Not sufficient stretch of the body after leaving the horse.

When it is required, as in this and most of the following exercises of this group, to touch the horse just momentarily with the feet, the "take off" should not be too close to it, and the jump should be forward and made before the hands are placed on the horse.

10. On the Feet and off with Arms swinging upward (horse broadways). "*Go*" or "*Begin.*"

As for paras. 4 and 9, above.

C.F.—As for paras. 4 and 9, above.

11. **Splits off** (horse lengthways). "*Jump.*"

From the position of *Attention* on top of and at the near end of horse, bend the knees slightly and spring forward, raising and stretching the legs until the body assumes a horizontal position above the horse, then place the hands, arms straight, on the far end, separate the legs allowing them to pass on each side of the end of the horse, at the same time push off with the hands, close the legs and assume an erect position before landing, as in Sec. 42, 5.

- C.F.—(1) Raising the seat instead of the legs after the jump.
 (2) Placing the hands too soon on the end of the horse.
 (3) Body not erect when landing.

12. **On the Feet and Splits off** (horse lengthways). (Plate 60, Fig. 138.) "*Go*" or "*Begin.*"

Jump off both feet, place both hands on the near end of the horse, bend the hips and knees well up placing the feet on the same end between the hands, immediately the feet touch the horse spring forward and perform the exercise as for "*Splits off*" para. 11, above.

- C.F.—(1) Pausing with the hands on the near end of horse.
 (2) Not sufficient stretch of the body above the horse.
 (3) Raising the seat. (4) Not sufficient push off with the hands.

13. **On the Feet and round Back between the Hands** (horse lengthways). (Plate 59, Fig. 137.) "*Go*" or "*Begin.*"

As for para. 12, above, except that instead of separating the legs to clear the end of the horse, round the back and bend the legs, keeping the knees and feet together well up under the body so as to clear the far end of the horse, assisting the forward movement by pressing off with the hands; stretching the body immediately the feet are clear, land as in Sec. 42, 5.

- C.F.—As for para. 12, above, and (5) Insufficient stretch of the body when clear of the horse.

In this exercise the feet should not pass between the hands, but the hands (assisting the forward movement) should quit the horse before the feet clear it.

14. **Left Hand vault** (horse broadways). (Plate 58, Fig. 136.) "*Go*" or "*Begin.*"

Jump off the right foot and keeping the left leg straight swing it over the horse followed by the right, placing the left hand, arm straight, on the top, at the same time swing the right arm upward to assist the raising of the body, the legs being

brought together as they pass over the horse. Land as in Sec. 42, 5, but facing away from the horse.

C.F.—(1) Not running straight to the horse. (2) Knees bent when above the horse. (3) Not making sufficient use of the right arm. (4) Jumping off both feet.

When this exercise can be performed correctly it may be introduced into Group ii, para. 1, above. The "take off" will then be further away from the horse.

15. **Bent backlift** (horse broadways). (Plate 61, Fig. 139.)
"Go" or "Begin."

Jump off both feet, raise the seat bending at the hip joints, the trunk and legs both kept straight to form an angle of about 45° , the head pressed slightly back, place the hands, fingers to the front, the width of the shoulders apart at the far side of the top of the horse, arms bent, supporting the weight of the body on the hands, allow it to travel over the horse until the balance is at the far side, then vigorously swing the legs in a circular movement towards the ground, at the same time press off with the hands, swinging the arms forward and downward to the sides, the body to be upright and fully stretched before landing as in Sec. 42, 5.

C.F.—(1) Back rounded. (2) Knees bent. (3) Head forward. (4) Fingers turned outward. (5) Bending the arms too much and allowing the chest to touch the horse.

16. **Neck spring** (horse broadways). "Go" or "Begin."

As for "*Bent Backlift*," para. 15, above, except that the hands will not be placed so far forward, the back rounded and the head bent well forward so that the back of the neck rests on the top of the horse between the hands.

C.F.—(1) Placing the top of the head on the horse. (2) Bending the knees. (3) Opening out too soon.

The exercise "*Neck roll*" (horse lengthways) performed in a similar manner by placing the hands about half-way along the top of the horse and rolling off the end, will be found a useful preparation for this exercise.

17. **On one Foot and Backlift** (horse lengthways). "Go" or "Begin."

Jump off both feet, place the hands on the near end of the horse, bend the left hip and knee to allow the foot to be placed between the hands, and without any pause spring off the left foot, raise the right leg, transfer the hands to the far end, fingers to the front and arms bent, the legs to be brought together and fully stretched before the hands meet the horse, the body now fully stretched, supported on the hands to describe a circular movement over the horse; when the balance is beyond

the far end push off with the hands, swinging the arms forward and downward to the sides, land as in Sec. 42, 5.

C.F.—(1) Pausing on the near end of horse. (2) Not springing high enough off the left foot. (3) Placing the hands on the far end of the horse too soon. (4) Not keeping the right leg straight.

A most useful exercise as a preparation for "*Hollow back backlift*" over the horse lengthways, para. 26, below.

18. Back somersault (horse broadways).

From the "*standing position*" with the forepart of the feet resting on the far edge of the horse, raise the arms freely to about the level of the shoulders, then, allowing the body to incline slightly backward, immediately spring upward and backward, lowering and raising the arms freely, with the bending and stretching of the knees to assist the spring, at the same time reaching upward and backward with the head, allow the feet to pass over it, by bending at the hip and knee joints, making a complete turn of the body backward. When the turn has been completed, stretch the body and land as in Sec. 42, 5, but facing the horse.

C.F.—(1) Inclining the body forward when bending the knees for the spring. (2) Not springing high enough. (3) Jumping backward too far. (4) Not turning quick enough. (5) Not making sufficient use of the arms.

This exercise can be performed with a "*Hollow back*," the back being arched and the legs to remain stretched after the spring.

Note.—Whenever a "*Back*" or "*Front*" somersault is being practised an instructor must be "*standing in*" to give assistance if necessary. (See Sec. 21.)

19. Front somersault (horse broadways).

From the "*Standing position*" on the far edge of the horse with the arms raised about the level of the shoulders, spring upward and slightly forward, then by bringing the knees to a sitting position, rounding the back, and lowering the head and hands towards the knees, make a complete turn of the body forward. When the turn has been completed stretch the body, and land as in Sec. 42, 5.

C.F.—(1) Inclining the body backward when bending the knees for the spring. (2) Springing too far forward. (3) Not jumping high enough. (4) Failing to open out after the turn has been completed.

If too much turn has been obtained, or the opening out left too late, causing the landing to be made with the body forward, the hands should be placed on the ground and a "*Forward roll*" performed.

20. Between the Hands (horse broadways). (Plate 62, Fig. 140.) "*Go*" or "*Begin.*"

Jump forward off both feet, place the hands on top of the horse, the width of the shoulders apart, and incline the body well forward, bend the legs well under it, so as to clear the horse, keeping the knees and feet together and assist the forward movement by pressing off with the hands, which should leave the horse before the feet pass between them. Immediately stretching the body when the feet are clear of the horse, land as in Sec. 42, 5.

C.F.—(1) Not sufficient pace and dash in the run. (2) Taking off too close to the horse. (3) Keeping the hands too long on the horse. (4) Not stretching the body before landing.

In this and the following exercises, paras. 21, etc., the object is to clear the horse with the feet, the "*take off*" should be further away from the horse than in the preceding paras. 3, etc., above, and the jump to be made well forward and before the hands touch the horse.

Note.—See para. 13, above, with regard to the hands quitting the horse before the feet pass them.

21. Splits over (horse lengthways). (Plate 63, Fig. 141.) "*Go*" or "*Begin.*"

Jump forward off both feet, raising the legs which should be kept straight and together until the body assumes a horizontal position above the horse, reach to the far end with the hands, arms straight, and without checking the forward movement separate the legs and clear the end of the horse, as for "*Splits off*," para. 11, above.

C.F.—(1) Insufficient pace and dash. (2) Not raising the legs high enough. (3) Not placing the hands far enough forward. (4) Bending the knees. (5) Separating the legs too soon.

22. Clear jump (horse broadways). "*Go*" or "*Begin.*"

Jump off one foot, raising the knees and feet sufficiently high enough to clear the horse, assisting the spring by a free upward movement of the arms. When clear of the horse, stretch the body; land as in Sec. 42, 5.

C.F.—(1) Putting too much pace into the run. (2) Not bending the knees sufficiently. (3) Taking off too far away from the horse. (4) Not running straight towards the horse.

A useful preparation for this exercise is "*On the Feet and off*," para 3, above, without the use of hands, i.e., jumping off one foot and alighting on the top of the horse with both feet.

23. **Scissors** (horse lengthways). (Plate 64, Fig. 142.) "Go" or "Begin."

Jump forward off both feet, raising the legs, which should be kept straight and together, place the left hand on the near end of the horse, reaching for the far end with the right hand; at the same time turn the body towards the left, until the back is towards the far end of the horse, and without checking the forward movement separate the legs, allowing them to pass each side of the end of the horse; land as in Sec. 42, 5, but facing the horse.

C.F.—(1) Not sufficient pace and dash. (2) Not raising the legs up sufficiently. (3) Not placing the right hand far enough forward. (4) Bending the knees. (5) Bending the body forward when landing.

When the right hand is placed on the near end of the horse, the turn of the body will be towards the right.

24. **Splits over** (horse broadways). (Plate 65, Fig. 143.) "Go" or "Begin."

Jump forward off both feet, place the hands on the horse, raise the seat and, keeping the knees straight, separate the legs so that the feet clear the top of the horse, assisting the forward movement by pressing off with the hands. Immediately the feet are clear of the horse, bring the legs together and straighten the body; land as in Sec. 42, 5.

"On the Feet and off with feet astride," carried out as for "On the Feet and off," para. 9, above, except that the feet are placed on the horse outside the hands, will be found a most useful preparation for this exercise.

C.F.—(1) Not sufficient pace and dash. (2) Taking off too close. (3) Not raising the seat high enough. (4) Not separating the legs sufficiently. (5) Bending the knees.

25. **Between the Hands** (horse lengthways). (Plate 65, Fig. 144.) "Go" or "Begin."

Jump forward off both feet, raising the legs, which should be kept straight and together, until the body is horizontal above the horse, reaching to the far end with the hands, arms straight, and without checking the forward movement, complete the exercise as for "Round Back between the Hands," para. 20, above.

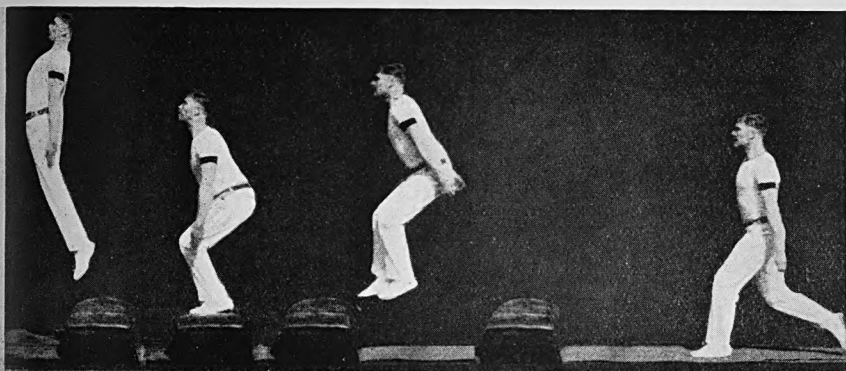
C.F.—(1) Insufficient pace and dash. (2) Not placing the hands at the far end of the horse. (3) Not raising the legs high enough. (4) Hands remaining too long on the horse.

26. **Hollow back backlift** (horse broadways). "Go" or "Begin."

Jump forward off both feet, raise the legs which should be stretched and together, well up in the air, at the same time

PLATE 56.

J. & V. Ex.

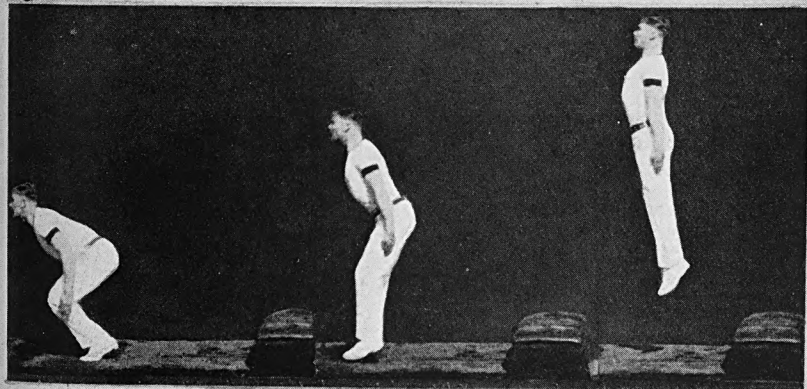


d.
Fig. 132

c.

b.

a.



g.

f.

e.

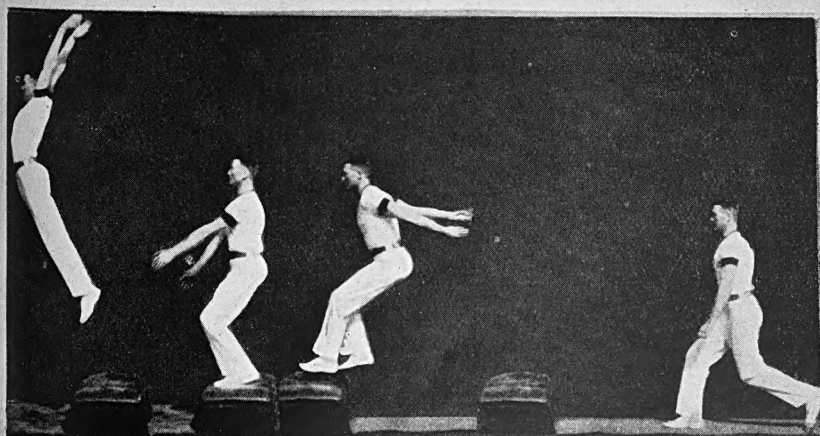


Fig. 133 *d.*

c.

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Contd. plate a. 57.

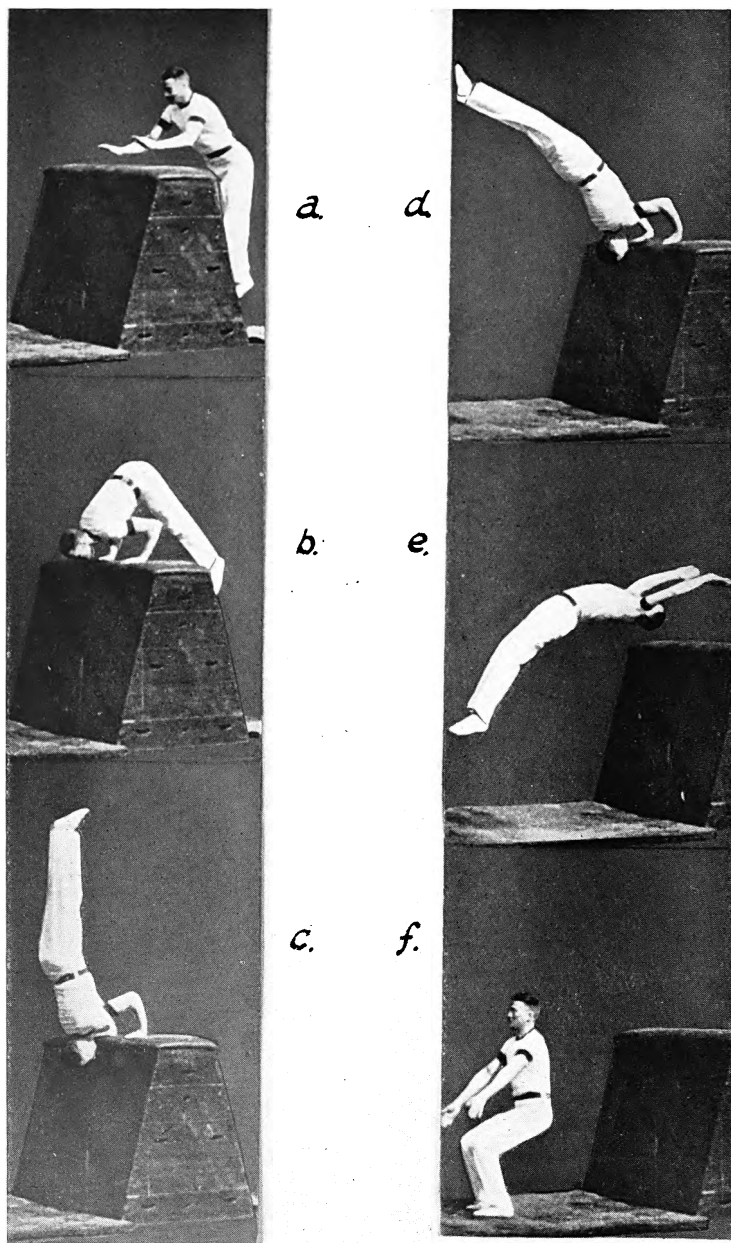


Fig. 139.

PLATE 62.

J. & V. Ex.

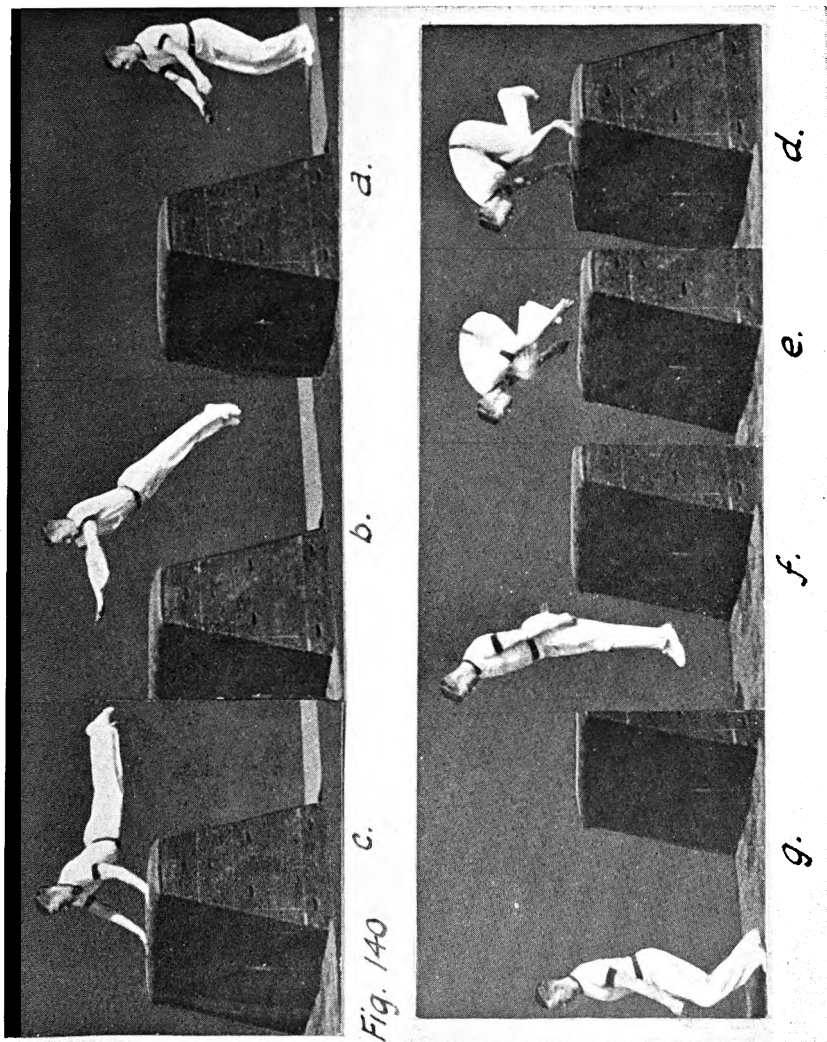


PLATE 63.

J. & V. Ex.

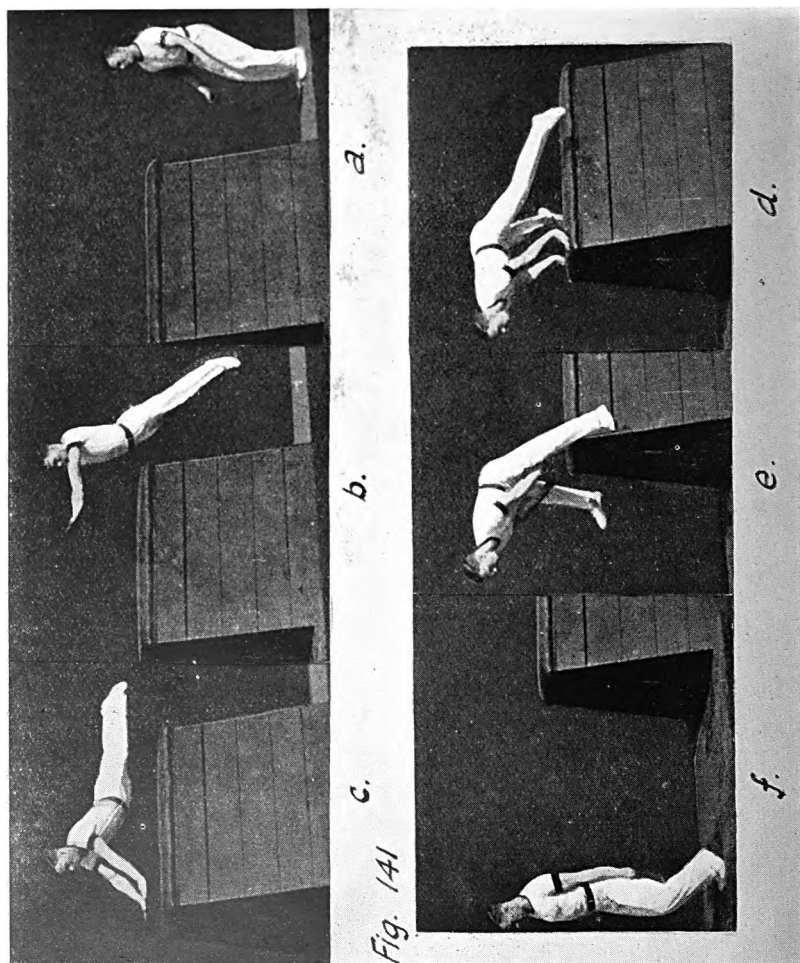
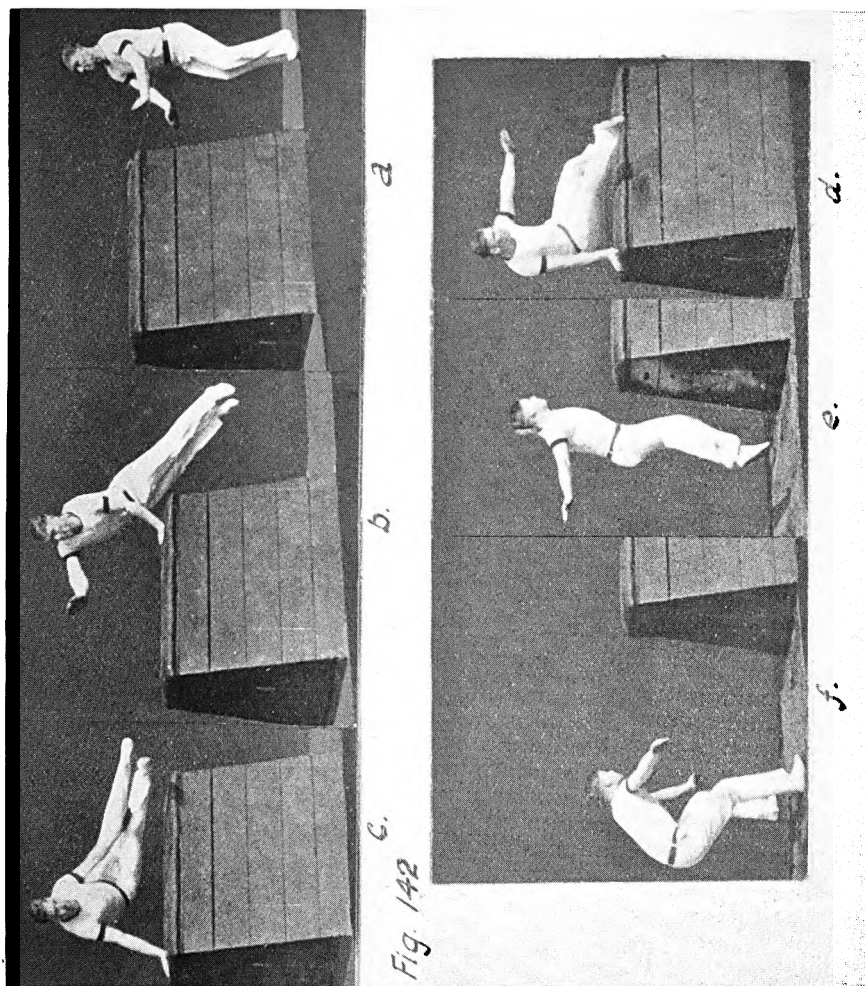


PLATE 64.

J. & V. Ex.



arch the back, pressing the head slightly backward, with the chin drawn in, place the hands the width of the shoulders apart, fingers to the front, on top of and at the far side of the horse, arms bent, the chest to be just clear of the horse, the weight of the body supported by the hands, allow the body to travel over the horse in a circular movement until the balance is at the far side, then press off with the hands, swinging them forward and downward to the sides; land as in Sec. 42, 5.

C.F.—(1) Insufficient spring. (2) Not forcing the legs upward immediately after the jump. (3) Allowing the chest to touch the horse. (4) Not maintaining the position throughout the exercise. (5) Elbows turned inward.

27. Hollow back backlift (horse lengthways). “Go” or “Begin.”

As for para. 26, above, except the hands are placed on the far end of the horse.

C.F.—As for para. 26, above, and (6) Not placing the hands far enough forward on the horse.

28. Hollow back between the Hands (horse broadways). “Go” or “Begin.”

Jump forward off both feet, place the hands, the width of the shoulders apart, on the top of the horse, then arch the back, press the legs backward, keeping them together and fully stretched, at the same time vigorously press off with the hands, travel upward and forward over the horse, the insteps just clearing the top. When clear of the horse, straighten the body, land as in Sec. 42, 5.

C.F.—(1) Insufficient pace and dash. (2) Taking off too close to the horse. (3) Not sufficient push off with the hands. (4) Knees bent and separated.

29. Back splits (horse lengthways). “Go” or “Begin.”

Jump forward off both feet, raising the legs which should be kept straight and together until the body is horizontal above the horse, reaching for the far end with the hands, arms straight, and without checking the forward movement turn the body and complete the exercise as for the “Scissors,” para. 23, above.

C.F.—(1) Insufficient pace and dash. (2) Not placing the hands far enough forward on the horse. (3) Turning too slow. (4) Not turning sufficiently. (5) Knees bent.

45. GROUNDWORK EXERCISES

(General Remarks, see Sec. 42)

1. The agility exercises in this group are mostly of a free nature, and they are arranged so that the accomplishment of the early exercise will create the confidence required for the harder exercises.

2. A student, to become a good ground worker, must be supple in his joints, and have control of his muscles, which should be well developed, a good sense of rhythm or timing and co-ordination of his limbs. This can only be produced by good work in the other exercises of a table and constant practice at the exercise required to be done.
3. The most common fault of students in practising these exercises is shutting the eyes, which during that moment causes loss of control, and they should learn to obviate this fault from the start of the training in these exercises.
4. (Attention.) **Front roll.** (Plate 66, Fig. 145.) "*Go*" or "*Begin.*"

Jumping off both feet, place the hands on the ground, and at the same time ball up the body and allow it to fall forward on to the back of the shoulders by tucking in the head; keep the body still balled up and allow the impetus of the jump to roll the body on the back until the feet come to the ground, then, reaching well forward with the arms, stretch the body upward and resume the position of *Attention*.

C.F.—(1) Hand and feet on the ground at the same time. (2) Not tucking in the head. (3) Rolling sideways. (4) Pushing up with the hands.

5. **Two front rolls.** "*Go.*"

As for para. 4, above, but after the first roll and the feet have come to the ground, keep the body still balled up and allow it to go forward into another roll, adding to the impetus of the movement by a slight push with the toes. After the second roll come to *Attention*.

C.F.—As for para. 4, above, and (5) Pausing after first roll. (6) Not keeping balled up after first roll.

6. (Attention Back to the mat.) **Back roll.** (Plate 66, Fig. 146.) "*Go*" or "*Begin.*"

Sink backward on to the mat, at the same time ball up the body and allow it to roll on the back on to the back of the shoulders. Place the hands on the mat in front of the shoulders and push up, allowing the head to come forward, at the same time straighten and open the legs so that the feet will come to the ground, straighten the body upright, close the feet and resume the position of *Attention*.

C.F.—(1) Not balling up enough and head not tucked in. (2) No impetus. (3) Not placing the hands back in the right place or at the right time. (4) No push with the arms. (5) Rolling sideways.

7. Front roll, jump about, and back roll. "Go" or "Begin."

Front roll as for para. 4, above. After coming to *Attention*.
Jump about and *Back roll* as in para. 6, above.

C.F.—As for paras. 4 and 6, above.

8. Roll without use of Hands. "Go."

As for para. 4, above, except the hands should not be used and the arms folded across the body.

C.F.—(1) Rolling sideways. (2) Not sufficient impetus.

In the early stages of this exercise and until it can be performed without fear of injury, one hand should be placed behind the neck as a protection, and the body balled up as in para. 4, above.

9. Dive over rope. (Plate 67, Fig. 147.) "Go."

Run forward and jump off both feet. Raise the arms forward and dive over the rope, landing on the mat on the hands; then act as for "*Front Roll*," para. 4, above.

C.F.—(1) No pace. (2) Shutting the eyes. (3) Landing on the head.

10. Hop step for handstand. "Go."

Hop on the left (right) foot and at the same time raise the arms to the forward raise position, palms to the front, and raise the right (left) knee with the foot slightly forward. Keeping the arms straight, swing them with the body downward and place the hands on the ground, at the same time placing the forward foot on the ground and swinging up the rear leg as high as possible, following it with the other; then allow them to return to the ground and resume the position of *Attention*.

C.F.—(1) Taking no weight on the arms. (2) No effort in the swing of the rear leg. (3) Hands too far forward.

This exercise is the first stage of balancing on the hands and other *groundwork* exercises, as it gives confidence in the strength of one's arms and shoulders. It also gives a sense of control under new conditions.

11. Handstand at wall or with support. "Go."

Hop as in para. 10, above, but swinging the rear leg allow it to go forward over the seat until it touches the wall or is caught in the hands of the supporting man, and follow it quickly with the other leg, at the same time press up strongly with the arms and force the shoulders forward. The back should be straight and the head well back with the eyes looking on the ground.

C.F.—(1) Not enough swing. (2) Hollowing the back. (3) Head not back. (4) Bending the arms.

This exercise (Plate 72, Fig. 153) is a preliminary one to holding a balance on the hands without support, and great care should be taken that the back is straight during its performance.

The distance from the wall, or support, is one of the chief points in the early stages; until the muscles of the back are strong enough to support the back in this position the exercise should not be performed farther away from the support than necessary. The approximate distance of the hands on ground away from the support should be 18 in. The position of the head is also of great importance, but care should be taken that it is not forced too far back.

Beginners should not be allowed to remain in this position too long as it may cause strain, and also blood pressure in the head.

12. (Attention.) **Starting position for cartwheel.** "Go."

With a hop off the right (left) foot, raise the left (right) arm to the forward raise position, palm to the front, at the same time raise the left (right) knee to the *Knee raise position*.

13. (Start. pos. for cartwheel.) **Cartwheel.** (Plate 68, Fig. 148.) "Go."

Lower the raised foot to the ground, at the same time swing the rear leg straight over the head, place the raised hand on the ground, allow the swing to bring up the other leg, also to carry the body over on to the other hand, passing through the handstand position with the legs straight and kept well apart. Back should be straight and head well back. Continue the swing round off the hand on to the leading foot and then on to the other, which should bring the body to the upright position. Turn to the front and resume the position of *Attention*.

C.F.—(1) Placing the hand on to the ground too soon.

(2) Not allowing the legs to go over the body. (3) Not keeping the back straight. (4) Not keeping the legs apart.

(5) No rhythm. (6) Bad control.

14. (Attention.) **Straight Arm roll over kneeling man.** (Plate 69, Fig. 149.) "Go" or "Begin."

Run forward, place the hands on the ground close to the kneeling man, arms straight and shoulders against his side, swing up the legs as in para. 11, above, and the pace from the run forward should carry them over his back. The weight and swing of the legs going over and the pivot of the shoulders against the side should cause the body to roll over the back of the kneeling man. As soon as the feet touch the ground the body should come to the upright position and resume the position of *Attention*.

C.F. 1. Hands too far away from kneeling man. 2. Head poked forward. (3) Arms bent. (4) No swing up of the legs.

15. (Attention.) **Handspring.** (Plates 71 and 72, Figs. 151 and 152.) "*Go*" or "*Begin*."

After a short run forward "take off" on one foot, swing the other vigorously to the rear, place both hands on the ground and swing the body so that it is carried on nearly straight arms. The head well back, the back straight, the hip joints bent, knees straight and feet together. When the body has passed through the vertical position and begins falling backward, the hip joints are vigorously stretched so that the legs are swung forward and towards the ground. Towards the end of the swing the hands push off strongly, and the body is brought into the upright position for the landing. In the landing the knees are bent with the feet apart in the astride position, and with a small jump the feet are brought to the position of *Attention*.

C.F.—(1) No effort in the swing of the rear leg. (2) Hands placed too far forward. (3) Arms bent. (4) Head not forced back. (5) No push with the hands. (6) Bad landing.

16. (Attention.) **Headspring.** (Plate 70, Fig. 150.) "*Go*."

As for a *Handspring*, para. 15, above, except that the arms are bent and the crown of the head is placed on the mat close to the hands.

17. (Attention, facing and close to the mat.) **Stationary headspring.** "*Go*."

Place the head and hands, with the fingers pointing forward, on the mat, the feet together, and as soon as they are off the ground make a slight pause. Allow the seat then to move backward and as soon as it has passed the point of balance, the hip joints are vigorously stretched so that the legs are swung forward and towards the ground and the hands push off strongly as in a handspring.

C.F.—(1) Not being stationary. (2) Pushing off the ground with the toes. (3) Beating too soon. (4) Bad landing.

18. (Attention, close to and back to the mat.) **Ground upstart.** (Plate 73, Fig. 154.) "*Go*."

Keeping the knees straight, allow the seat to fall backward by bending the body forward and with sufficient momentum to let the body roll as soon as it has touched the mat on to the shoulders and neck. Place the hands back by the side of the head with the fingers pointing towards the shoulders, and allow the legs to move well back over the head. With a double beat

of the legs upward, forward, and downward, and a vigorous push with the hands and the neck, on the second beat the body comes to the upright position, landing with the feet apart and knees bent. With a small jump come to the position of *Attention*.

C.F.—(1) Bending the legs on going down. (2) Not obtaining the correct beat off the neck, shoulders, and hands. (3) Bad landing.

19. Cartwheel and handspring. “Go” or “Begin.”

Cartwheel as in para. 399 and on coming to the upright position turn to the front and without any pause or other movement carry out a *handspring* as in para. 15, above.

C.F.—As for paras. 13 and 15, above. (7) Making a pause after the cartwheel. (8) Lack of control.

20. Backroll to Handstand. “Go.”

Backroll as in para 6, above, but, when in the rolling, rest on the shoulders and the back of the head, the hands are placed on the mat at the sides of the head and with the fingers pointing towards the shoulders. With a vigorous stretching of the arms, the hip joints, and a bending backward of the head, the *Handstand* position, Sec. 45, 11, is taken, held for a moment and the feet then allowed to come to the ground.

C.F.—As for para. 6, above, and (7) Not holding the handstand. (8) Giving away with one arm.

46. FINAL AND CORRECTIVE EXERCISES

1. At the end of a table of exercises it is necessary and beneficial to conclude with some quiet and easy exercises to bring the body back into its normal condition, and also to correct the faults in the carriage which may have crept in during the agility work.
2. These exercises generally consist of those for the Legs, Arms, and Neck, and are already detailed in their respective groups.
3. A breathing exercise (always taken free) should finish the table, and it has been found by experience that better thoracic movement is obtained with the weight of the arms lifted off the shoulders. This can be obtained by allowing the arms to rest in the *Hips Firm* position—but quite relaxed. To give more relaxation the feet astride position should be adopted. During the breathing exercises *Inhaling* and *Exhaling* should be done through the nose as this helps to give a free passage through the nostrils.

PLATE 67.

Gd. Wk. Ex.

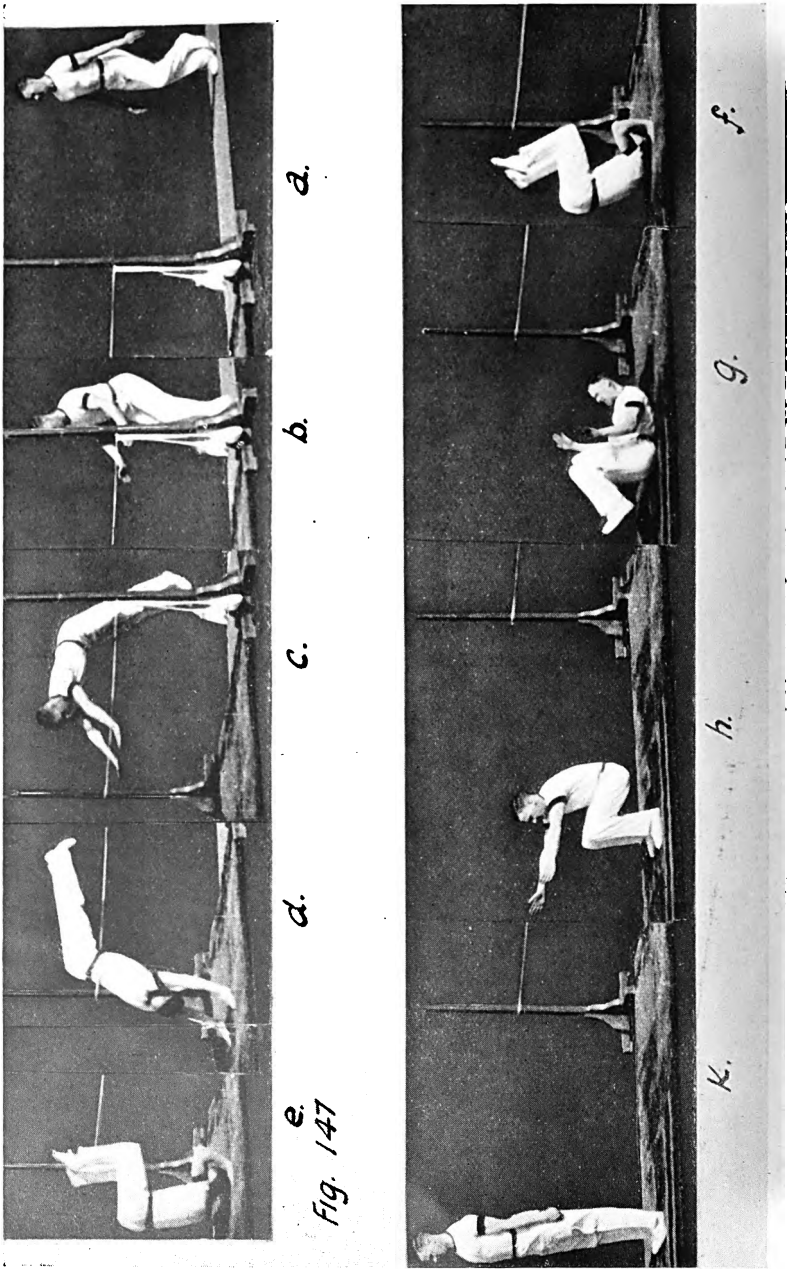
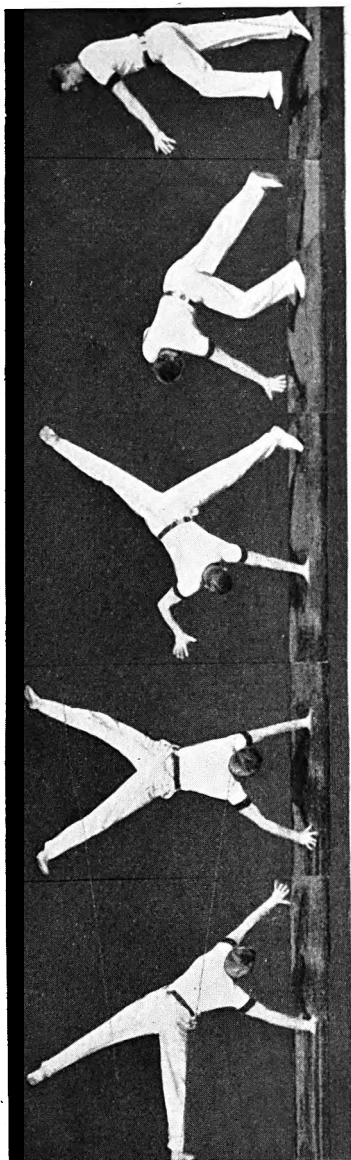


PLATE 68.

Gd. Wk. Ex.



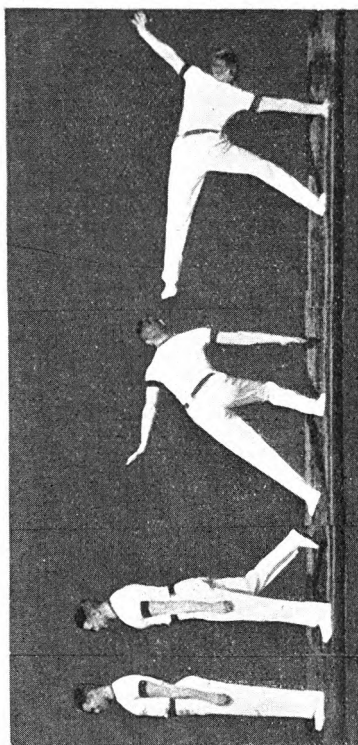
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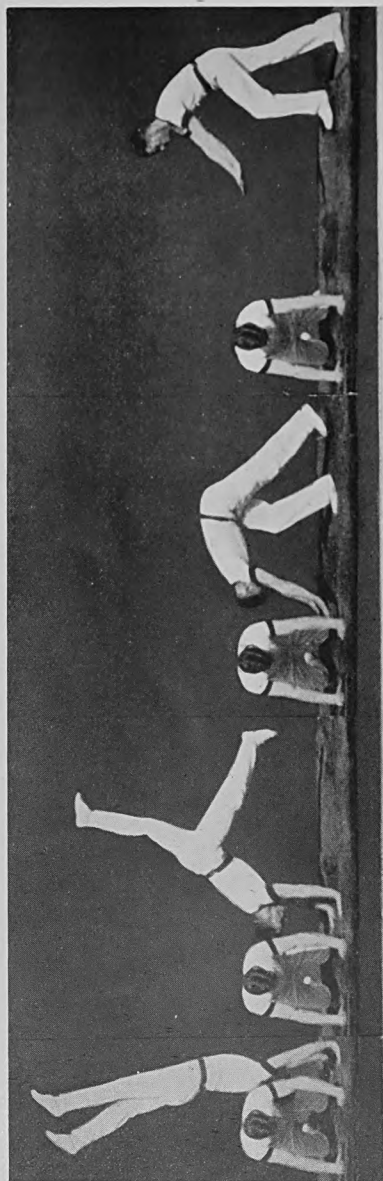
h.

k.

Fig. 148.

PLATE 69.

Gd. Wk. Ex.

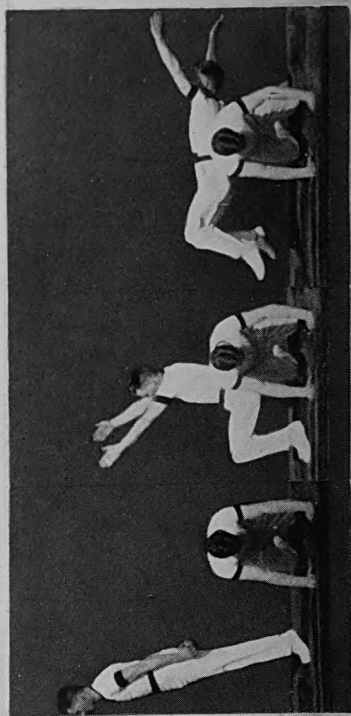


a.

b.

c.

d.



e.

f.

g.

Fig. 149

PLATE 70.

Gd. Wk. Ex.



a.

b.

c.

d.

e
Fig. 150



f.

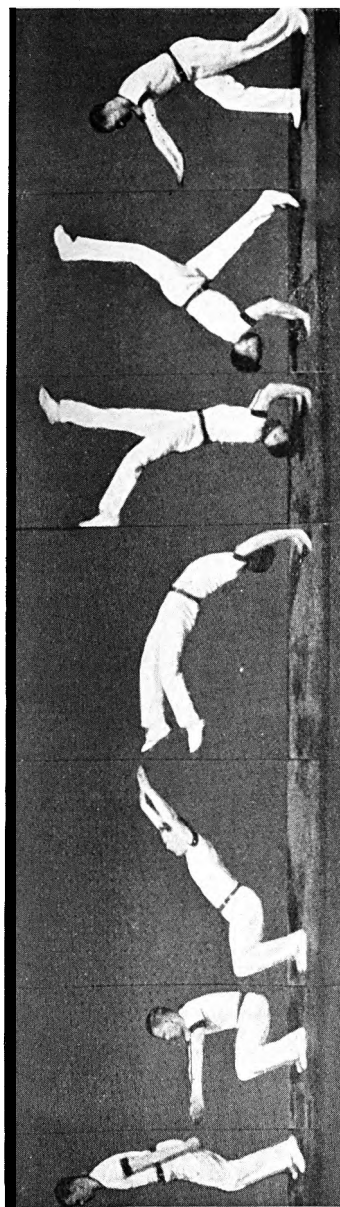
g.

h.

k.

PLATE 72.

Gd. Wk. Ex.



a.

b.

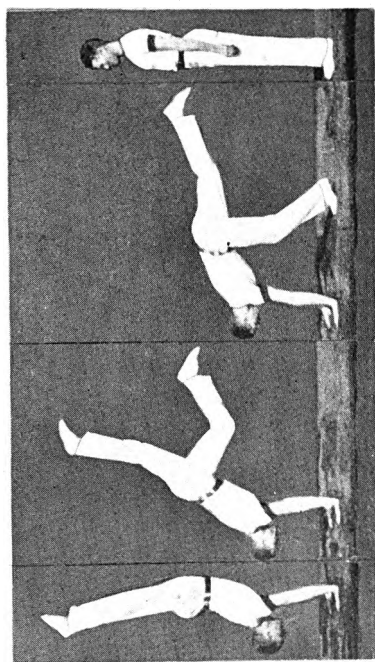
c.

d.

e.

f.

g. Fig. 152.



a.

b.

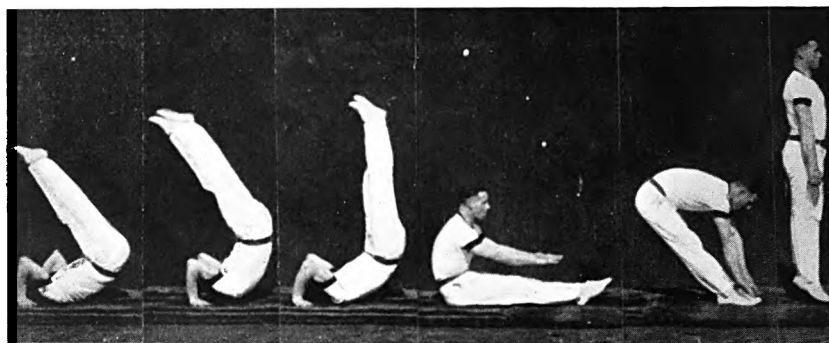
c.

d.

Fig. 153

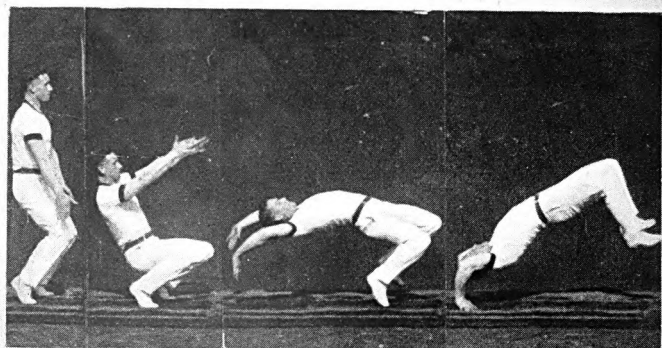
PLATE 73.

Gd. Wk. Ex.



f. e. d. c. b. a.

Fig. 154



k. j. h. g.

CHAPTER VIII

OBSTACLE TRAINING

47. GENERAL REMARKS

The following exercises are all of a practical nature, and prepare for surmounting obstacles in the field. Efforts should be made to provide obstacles, other than those here referred to, locally for the purpose of improving this branch of the training. Apparatus, etc., may also be arranged as obstacles in the gymnasium with the same object, and the men practised in surmounting them, following each other in succession in single rank, files or fours, rapidly and smartly.

These exercises should be taken in the Table with the Jumping and Vaulting, and should also be practised regimentally at any convenient season by men who have completed their recruit's training.

At first they should be taught in detail, but as soon as possible be taken free, the regular progression of the physical training enabling this to be done without difficulty.

The mounting of the shelf can also be included in this training, but this detail is taught in the heaving group of exercises, Sec. 37, 24 to 31.

48. TEN-FOOT WALL

1. The class will be drawn up in fours turned to the right, at loose intervals, facing the wall about eight paces from it, and standing at ease.
2. *Surmounting wall with assistance.*—(1st Method.) (Plates 74 and 75, Fig. 155.)

First four, to the wall—Ready. “*Ready.*”

The *first four* will spring to *Attention*, double out and assume the *Ready* position as for the front rank below shelf, Sec. 37, 24, but with the right shoulder, buttock and foot against the wall. The *second four* spring to *Attention*.

Next four—Up (*second four*). “*Up.*”

The *second four* will act as described for the rear rank at the shelf, but using the hands while rising to steady themselves against the wall, and then grasping the top of it and swinging

the right leg over to the right, assume the position of *sitting astride* the wall facing the left. The *first four* assist as described for front rank at shelf, Sec. 37, 24.

Next four—Ready (*third four*). "*Ready.*"

The *third four* will act as described above for the first four.

The *second four* will dismount on the far side of the wall by swinging the left leg over by the rear, letting themselves down to the full extent of the arms with the hands grasping the top of the wall, and then quitting with the right hand, press away from the wall with it, quit with the left hand and drop to the ground, turning about in the air so as to face away from the wall and landing as usual.

The *first four* double about eight paces forward, and turn about, moving "*free.*"

Next four—Up (*first four*). "*Up.*"

The *first four* will mount the wall as described above, assisted by the *third four*. The second four will move forward on the far side of the wall, or form up in any position that may be ordered.

And so on, each section of fours alternately assisting and mounting until the last section is left at *Attention* at the foot of the wall.

"Ones"—Up. "*Up.*"

The "*Ones*" or *odd numbers* of the section may then mount the wall as above, assisted by the "*Twos*" or *even numbers*, thus leaving two men (front and rear rank) at the foot of the wall.

Front rank—Up. "*Up.*"

The *front rank* man may then mount the wall to the *sitting astride* position, assisted by the rear rank.

The last man (rear rank) may then mount with assistance as follows :

Last man—Up. "*Up.*"

The *front rank* man swings the left leg over the wall to the rear and, leaning over the wall with his legs on the far side, reaches downward with his hands on the near side, fingers interlaced, arms straight, and slightly away from the wall.

The *rear rank* man takes a short run, jumps forward and upward at the wall, placing his left foot against it as high as he can conveniently manage, and seizes the hands of the front rank man with his own right hand, making certain that his fingers are round the inside edge of the hands of his front rank man, followed immediately by the left.

Both men then pull upward, and the rear rank man transfers first one hand and then the other to the top of the wall, and continues to rise above the wall till he is able to throw his right leg over it, and so assume the sitting position.

As soon as the rear rank man has transferred both his hands to the wall, the front rank man lets himself down on the far side in the usual manner.

Last man—Down. “*Down.*”

The last man lets himself down in the usual manner.

The above is the usual method of teaching a class to surmount the ten-foot wall, as it is suitable for the usual length of these walls. Should, however, the length of the wall admit, a whole rank may be assisted up at the same time; then the “Ones” (or odd numbers) of the remaining rank assisted by the “Twos” (even numbers), and then every other man assisted by the man next on his right, and so on, on the principle described above.

The whole class, or as many of them as possible, may also be taught to surmount the wall as described for the “last man” with assistance from above.

In teaching a class carrying rifles to surmount this wall, the rifles should be slung as for escalading, or they may be passed over in batches when one set of men are on the far side and one set on top of the wall.

3. Surmounting wall with assistance.—(2nd Method.) (Plate 76, Fig. 156.)

Ready. “*Ready.*”

The section will form up facing the wall in single file, No. 1 placing himself ready to mount with Nos. 2, 3 and 4 ready to assist, i.e.—No. 1 close to wall, raised upon his toes with arms stretched above his head, hands against the wall. Nos. 2 and 4 on No. 1's right and left hand respectively and catching hold of No. 1's heels. No. 3 standing directly behind No. 1. Remaining files, directly behind No. 3.

Begin. “*Begin.*”

Nos. 2 and 4 lift No. 1 on to the wall; No. 1, keeping his knees straight during the lift, catches the top of the wall and then acts as in para. 2, above. No. 3 takes care to steady No. 1 during the lift, to prevent him falling backward. Immediately No. 1 is on the wall, No. 2 takes 1's place, 3 takes 2's, 4 takes 3's, 5 takes 4's; the remaining files close up. The movement is then repeated until only two men remain, these then act as for 1st Method.

Last Man—Up. “*Up.*”

As for para. 2, above.

If the length of the wall permits, the section should be split up into several files.

Note.—This method is useful when men are wearing equipment, etc., and the most agile man should be selected to be the last man to go over.

49. OBSTACLE COURSE

1. The following are the usual obstacles provided for instructional purposes :—

Posts and rail 2 ft. high	..	Clear jump.
Posts and rail 3½ ft. high	..	Left or right Hand vault.
High wall 12 ft. high	.. ..	Surmount with assistance.
Ditch (varying width)..	..	Long jump.
Wall 6 ft. high	.. ..	Surmount without assistance.
Inclined and horizontal planks		Run up, along and downward jump
Double trench .. ..	.. ..	Double stride jump.
Ramp and trench .. ..	.. ..	Jump down

These obstacles are usually arranged so that four men can negotiate them at the same time. The class should therefore be drawn up in fours (on a wider front if there is room), turned to the right, and facing the first obstacle about eight paces from it. The movement between the obstacles should always be at a "free" double, and the following progressive steps taken to teach the men to negotiate the whole course.

2. *By word of command.*—

First four, clear jump—Go. "Go."

Double forward, jump as usual, and move forward a sufficient number of paces to admit of the remainder of the class forming up behind them, halt and stand at ease.

Each section of fours will then be ordered to "Go" in like manner.

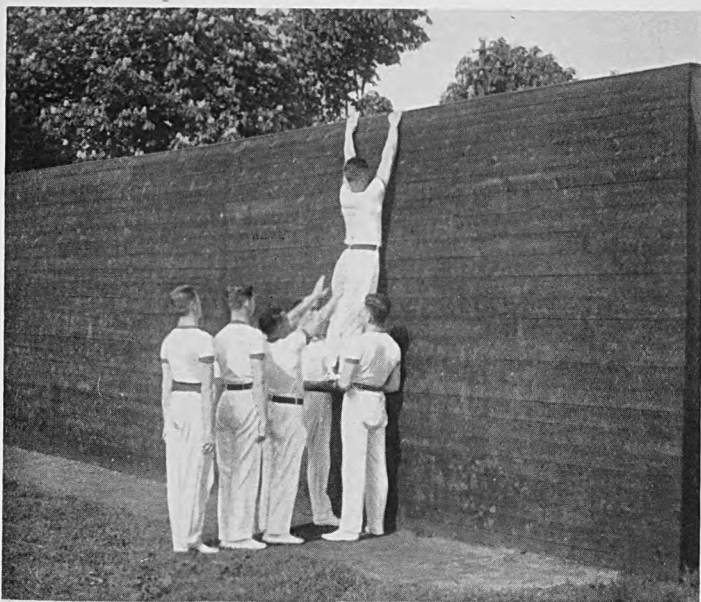
First four, left Hand vault—Go. "Go."

Double forward, vault as ordered and move forward as before. And so on, the same procedure being adopted for the other obstacles, each being cleared by the whole class before the next is taken.

The six-foot wall is surmounted as follows :—Run forward and jump forward and upward at the wall, placing the left foot against it as high as can be conveniently managed, seize the top with both hands and mount to the sit. astr. pos. by

PLATE 76.

Obstacle Training.



b.

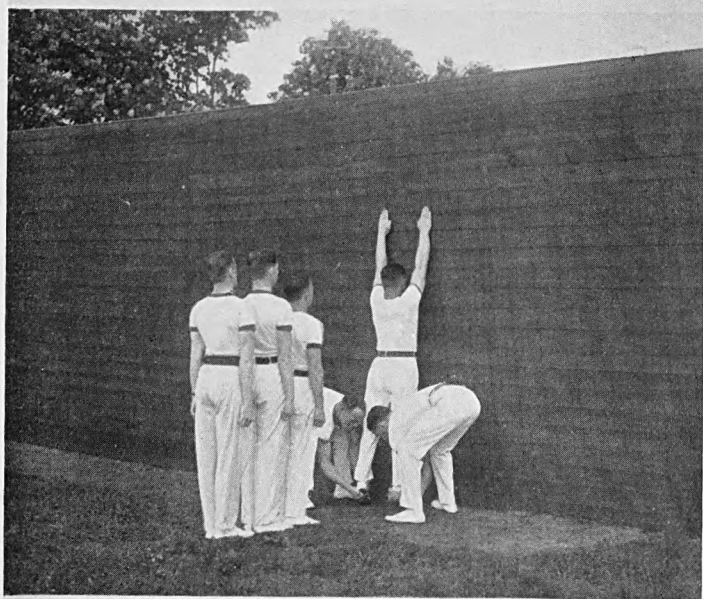


Fig. 156

a.

swinging the right leg over to the right. Then place both hands in front of the body on the top of the wall, swing the left leg over by the rear, and vault to the ground, placing the right hand on the far side of the wall in doing so, as in vaulting over double beam.

When "judging the time" the sit. astr. pos. should be omitted, and the wall cleared at once by bringing the left leg up to the right as it is swung over the wall.

When rifles are carried, the right forearm should be placed on the wall instead of the hand, and the rifle held clear of it in mounting; the sit. astr. pos. must then be taken, and care taken in dismounting to prevent damaging the rifle.

3. *Judging the time.*—

The class being drawn up as described, the word "Go" is given at the start only to each section of fours when the section in front has gone sufficiently far to prevent checking the pace at any time during the course. Each section should then complete the whole course without further word of command at a good sharp pace without pause, keeping their dressing by the right or left hand man as directed.

To encourage the spirit of emulation, the men in each section of fours may (when reasonably proficient) be allowed to race the whole length of the course.

50. INDOOR OBSTACLE TRAINING

1. In arranging an obstacle course in a gymnasium or drill hall an instructor should use his initiative and imagination, but the following points should be considered when making the obstacles:—

Each obstacle should adhere to the principles of physical development as laid down in this manual. They should develop and include such soldierly qualities as control, resource, enough dash and speed, and also serve some definite military purpose in the field.

2. All gymnastic and physical training apparatus may be utilized, but improvised apparatus, such as benches, cord, sacking, sandbags, wire, and human obstacles, may be used.
3. Two suggested indoor obstacle courses will be found detailed in the Recruits Physical Training Card, and also an improvised course. They are merely a guide, and the instructor must use his initiative according to the apparatus available.

CHAPTER IX

RUNNING

51. DISTANCE TRAINING

1. *Running exercises* are performed in the course of physical training for their educational effect, to teach the recruit the proper method of moving, and, with the other exercises of the course, to prepare him for *Running training*, the object of which is to enable him to cover a reasonable distance at fair speed without any undue signs of fatigue.

Running training should be carried out from the commencement of a recruit's attendance at physical training. One run a week should be arranged at depots. The distance to begin with should not be more than a mile in length and should be increased gradually. The recruit should be able to run three miles in fair time by the termination of his training at the depot.

2. The proper style for running should be taught to the recruit from the start of his training. A natural, easy swinging stride on the ball of the foot, with the body slightly forward so as to maintain perfect balance. The whole of the body must be completely relaxed, thigh, knee, and ankle joints all working freely and without stiffness. The feet should be placed down as straight as possible to the front. The heels may be allowed to touch the ground, but the action must not develop into a flat-footed one. The ball of the foot should touch the ground first, the action being a rocking one, from the ball of the foot to the heel and back again to the ball of the foot. The arms should swing naturally from front to rear, with a slight inward swing in the forward motion, never further than an imaginary line through the centre of the body. On the backward motion they should go no further to the rear than the line of the hips. Hands should not be clenched, but carried naturally. The head well balanced, and not thrown forward or in a backward position.
3. At no time should a recruit be allowed to run full out, the pace or time limit for runs being increased as progress is made in fitness and training.

Care must be taken not to overdo running during recruit's training. The age and general bodily fitness of the majority

of recruits on joining does not allow for great reserves of strength, and any overstraining might be fatal to the health of the recruit later.

4. The main object to aim at is to produce bodily fitness and correct leg and arm action. Speed and endurance will come as the result of the physical and other training which is carried out at depots.
5. Running should be carried out by squads and not in masses, in order that men in different stages of training may not be pitted against each other.
6. The clothing, etc., to be worn during running practices vary with the weather. The most important point is that the men are kept warm.

Shorts, socks, shoes, and a football jersey should usually be worn, cardigans or sweaters only being discarded immediately prior to starting. If the weather is cold cardigans and even mittens should be worn to run in. The moment limbs get cold, an extra amount of energy is required in order that the muscles may operate properly. This not only affects running adversely but causes strain, which must be avoided if possible.

7. Steps should be taken to ensure that men can have either a bath or a good rub down after running. Loitering about unsuitably clad should be guarded against.
8. Running should not be carried out before breakfast, or too soon after a meal.
9. Men coming off furlough, from hospital or from employment which has prevented them from having such training for some time, must be considered and brought into condition by degrees, or serious harm may be done.

CHAPTER X

RECREATIONAL PHYSICAL TRAINING

52. GENERAL REMARKS

1. The value of active games and athletics in providing exercise of a recreational nature has been alluded to in Sec. 1, 9. The greater the variety of athletic amusements which the men are given the opportunity of taking up the better, in order that individual tastes may be suited, and as many men as possible encouraged to develop habits of activity by employing their leisure time in healthy recreation.
2. What may be termed *Recreational Physical Training*, as distinct from *Educational Physical Training*, may therefore be included under the same category as athletic games, and opportunity afforded for its encouragement.
3. The following may be classified as *Recreational Physical Training*, viz. :—

Boxing.
Wrestling.
Swimming.
Bayonet fencing.
Fencing (Foil, Épée, Sabre).
Pass ball.
Etc.

To the above may also be added exercises with the following apparatus :—

Horizontal bar.
Parallel bars.
High vaulting horse.
Pair of rings.
Indian clubs.
Etc.

4. The various exercises on the apparatus here referred to are very numerous, and the difficulty of describing them satisfactorily on paper is very great ; it is not therefore considered advisable to include them in this manual. A variety of such exercises are, however, taught at the Army School of Physical Training, Aldershot, and the services of trained N.C.Os. should therefore be available to teach these exercises, as required, to men who are desirous of learning. Whenever a gymnasium is open for voluntary practice one or more certificated N.C.Os. should be in attendance to assist by their advice and example.

5. The practice of Recreational Physical Training being purely voluntary, there is no great danger of the men straining themselves by overdoing it. The certificated N.C.O. on duty in the voluntary hours must, however, take care that dangerous exercises are not attempted by "untrained" men. He should also be ready to assist and advise beginners according to their capacity, to "save" men who require it when performing exercises in which there is a chance of falling, and to teach the men how to help each other. (*See Sec. 21.*)
6. The introduction of recreational features into the regular "physical training" tables should also be encouraged, especially in the agility groups, but care should be taken that it is not overdone. This may be done by occasionally making ranks, sections of fours, etc., compete against each other in a rapid succession of "free" vaults and jumps, surmounting obstacles, etc., or in any other way that can be devised, in order to promote interest in the work, and encourage rapidity and freedom of movement. The value of the judicious combination of such recreational features with the more definitely ordered methods of training can hardly be over-estimated, and instructors should therefore frequently introduce exercises of this nature into the training.

CHAPTER XI

ELEMENTARY ANATOMY AND PHYSIOLOGY

53. THE BONES OF THE SKELETON, ETC.

1. **Introduction.**—It is essential that the student who is to become an instructor of physical training should have a sound knowledge of elementary anatomy and physiology. Only by this knowledge can he understand the capabilities and limitations of the delicate machine which he is to control. **Anatomy** is the study and description of the various parts of the human body in their relation to each other. In fact it is the geography of the body.

Physiology deals with the mechanics of the body, i.e. the manner in which the body works.

2. The **skeleton** is the framework of the body and consists of a number of bones, some long, some short and irregular, held together by bands or ligaments at the joints, which allow of greater or less movement between them. The bones determine the general shape and proportions of the body, give attachments to the muscles, and form levers on which the muscles act to perform the various movements of the body. They also form cavities for the protection of important organs.
3. A **joint**, or articulation, is the place where two or more bones work on each other. The ends of the bones where they touch one another are covered with a smooth, glistening material called **cartilage**, and they are kept together by bands which allow the bones to move in certain directions, but are tight in certain positions, so as to prevent the bones from slipping out of place. These bands are called **ligaments**. Inside the joint is a liquid, like the white of a raw egg, called **synovial fluid**, which lubricates the end of the bones, and allows them to glide smoothly over one another. The membrane which lines the joint and provides this material is called the **synovial membrane**.

The two principal kinds of joints are the ball and socket and the hinge joint. The ball and socket joint allows one of the bones to move freely in all directions. The shoulder and hip are joints of this description. The second kind of joint, working like the hinge of a door, allows of movement up and

down or backwards and forwards only, as in the elbow and knee.

4. The bones of the head and face are together called the **skull**. The skull consists of two portions, viz.: The **cranium**, a

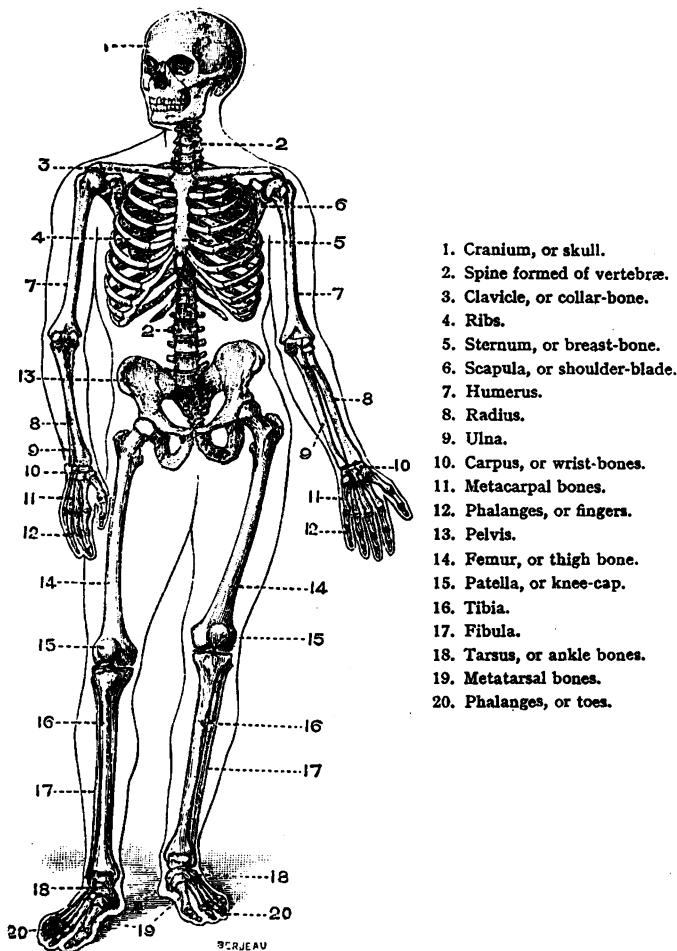


Fig. 157.—THE SKELETON.

strong bony case for the protection of the brain, and the **face**, which consists of a number of bones, of which one only, the lower jaw, is movable. There is a hole in the base of the skull, through which the spinal cord communicates with the brain.

5. The bony parts of the trunk are the spinal column, the thorax and the pelvis.

The **spinal column**, or backbone, is composed of twenty-four separate and somewhat similarly shaped bones called **vertebræ**, placed one above the other.

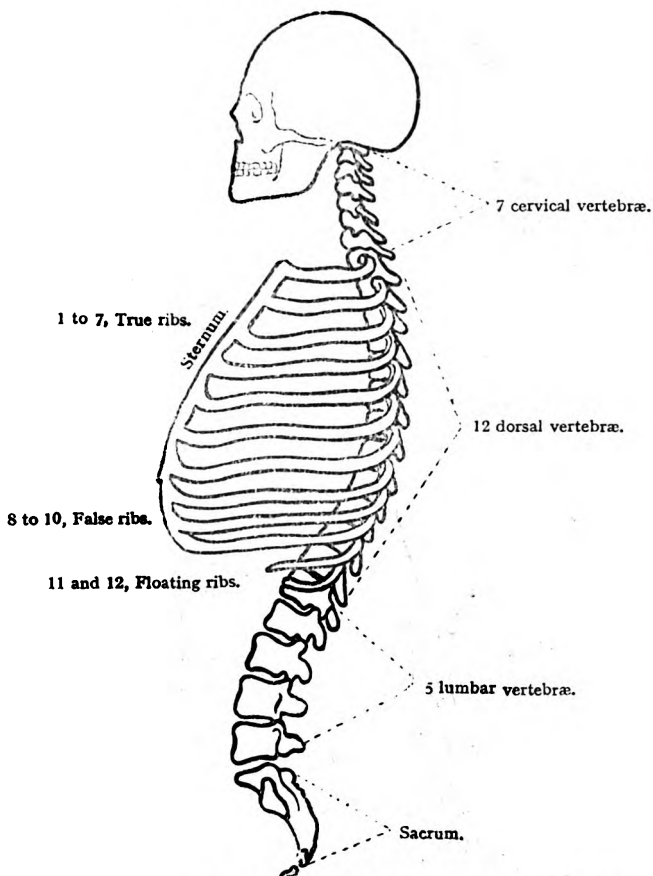


Fig. 158.—SKULL, SPINAL COLUMN AND THORAX (side view).

The 24 vertebrae of the spinal column are divided as follows from the top downward into :—

7 cervical, or vertebrae of the neck.

12 dorsal, or vertebrae of the back.

5 lumbar, or vertebrae of the loins (small of the back).

The seven **Cervical vertebrae** are the smallest in the spinal column and allow of the most movement. The first is called

the **Atlas** and supports the skull in such a way as to allow of a nodding movement of the head. It is shaped like a ring across the centre of which is a strong fibrous band dividing the ring into anterior and posterior halves. The former takes the peg of the second cervical whilst the latter contains the spinal cord.

The second cervical vertebra is called the **axis**. It is also shaped like a ring and contains the spinal cord, but in addition has a peg of bone, which fits into the anterior half of the **Atlas**, forming an "axis" on which the head rotates.

The remaining vertebræ are so similar in shape that one general description will suffice.

Each of the ordinary vertebræ is composed of :—

- (a) A thick disc of bone called the **body**.
- (b) An arch of bone situated behind the body. In the complete spine these arches form a long tunnel, which contains the spinal cord.
- (c) A projection of bone on either side of the arch called the **transverse process**; and one projecting backwards called the **spinous process**.

The twelve **dorsal** vertebræ are larger and stronger and give attachment to the twelve pairs of ribs. They are the least mobile vertebræ of the spine.

The five **lumbar** vertebræ are still larger and stronger. The fifth lumbar rests on a bone called the **sacrum**.

The spine, when held as erect as possible, is not perfectly straight, but is curved forward in the cervical portion, backward in the dorsal, forward again in the lumbar region and backward at the sacrum.

Between the vertebræ are pads of elastic cartilage, which prevent jarring and allow of a certain limited movement of the vertebræ, and consequent bending and turning of the spinal column. The movement, owing chiefly to the shape of the vertebræ, is greatest in the cervical region, less in the lumbar and least in the dorsal.

6. The **thorax**, or chest, is a large bony cavity containing the heart, lungs, gullet, etc., and great blood vessels. It is formed by the union of the twelve dorsal vertebræ with the ribs and the **sternum**, or breast bone.

There are twelve **ribs** on each side. Each pair of ribs is connected behind by movable joints with the dorsal vertebræ. The upper ten pairs are connected in front by means of broad flat cartilages with the sternum (the first seven direct and the eighth, ninth, and tenth by means of the cartilages of the ribs next above them).

The ribs are inclined downwards from the backbone, and, when raised, as in inspiration, the cavity of the thorax is increased; and, when lowered, as in expiration, the cavity is diminished.

7. The **pelvis** is composed of the **sacrum** and the **innominate** (or nameless) bones, one on either side, which are firmly united to form a basin-shaped cavity, which contains the lower parts of the abdominal viscera. The lower limbs are attached to the pelvis.

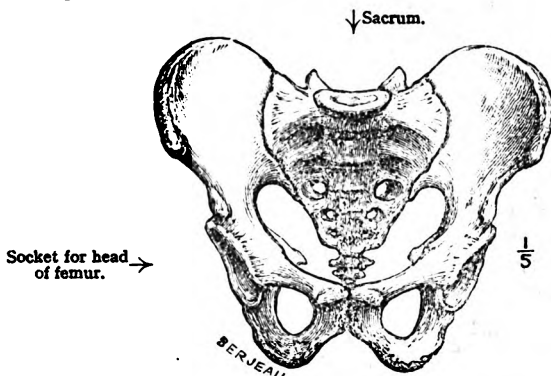


Fig. 159.—THE PELVIS.

8. The upper limb is joined to the trunk by the **shoulder girdle**, which consists of the collar bone or **clavicle** in front and the shoulder blade or **scapula** behind. The clavicle is a long curved bone which is attached to the **sternum** at its inner end and to the **acromion process** of the **scapula** at its outer end. The **scapula** is a flat triangular bone, which lies on the ribs behind. At its outer angle is a socket for the humerus, with which it forms the shoulder joint. Just behind the joint is a projecting bone called the **acromion process**. The scapula is attached to the trunk by muscles, thus allowing a large range of movement.



Fig. 160.—RIGHT COLLAR-BONE (seen from above).

9. The bone of the upper arm is called the **humerus**; it is a long bone having at its upper end a rounded head, which works in a socket in the **scapula**, or shoulder-blade, and at its lower end a roller-shaped surface, which, with the bones of the forearm, forms the elbow joint. The socket in the scapula,

being shallow, the humerus has a wide range of movement in all directions at the shoulder joint.

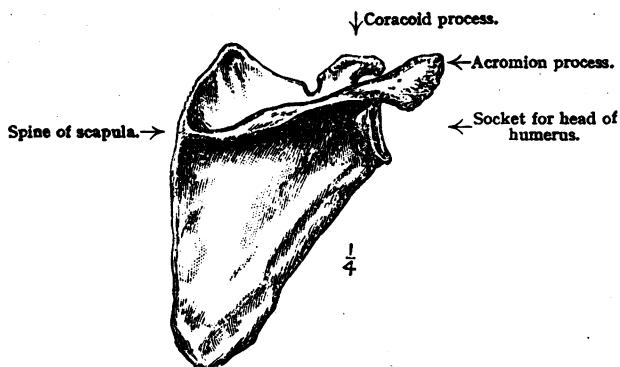


Fig. 161.—RIGHT SHOULDER-BLADE (seen from behind).

10. The bones of the forearm are the **radius** and the **ulna**. The radius extends from the outer side of the elbow to the thumb side of the wrist. The ulna extends from the inner side of

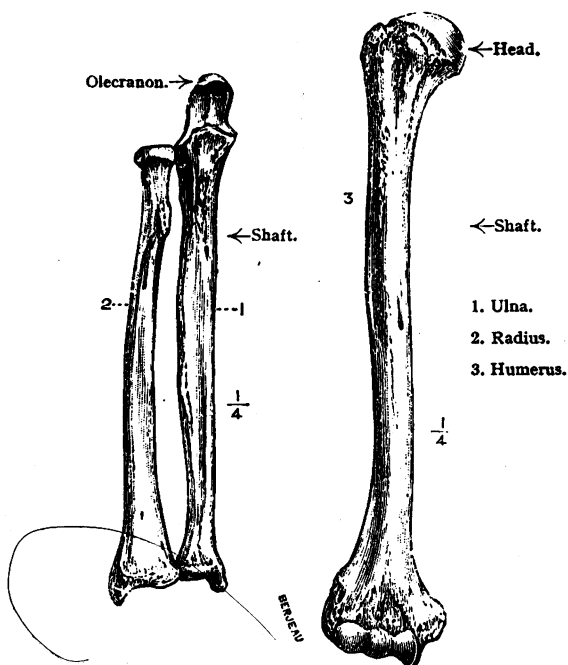


Fig. 162.—BONES OF THE RIGHT ARM AND FOREARM.

the elbow to the little finger side of the wrist; at its upper end is a projection, called the **olecranon**, which forms the point of the elbow, and serves as the point of attachment for the muscles which straighten the arm. The ulna forms a hinge joint at its junction with the humerus. The radius is attached to the ulna at both ends, and is capable of rotation round it, and, as the wrist is attached to the lower end of the radius, the hand is turned into pronation (palm downwards) and supination (palm upwards) by the rotation of this bone round the ulna.

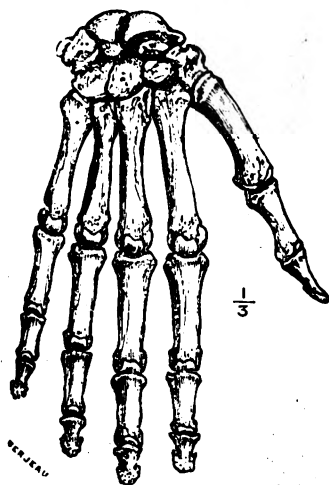


Fig. 163.—BONES OF THE RIGHT HAND.

11. The bones of the hand are arranged in three rows; firstly, in the wrist are eight small bones, called the **carpus**; secondly, a row of five long bones, called the **metacarpus**, forming the palm; and, lastly, three small bones for each finger and two for each thumb called the **phalanges**.
12. The lower limb is divided into the thigh, the leg and the foot.

The **thigh** is that portion which extends from the hip above to the knee below; its one bone is named the **femur**, or thigh bone, and is the largest and strongest in the body. At its upper end there is a rounded head which fits into a deep cup-shaped socket in the outside of the pelvis, forming the hip joint; below, the expanded end enters into the formation of the knee joint. Protecting the knee joint in front, and serving as a point of attachment for certain muscles, is a small bone called the **patella**, or knee-cap.

The ball and socket junction of the femur to the pelvis admits of movement of the thigh in all directions, but owing partly to the deepness of the socket the movement is more limited than that of the shoulder joint.

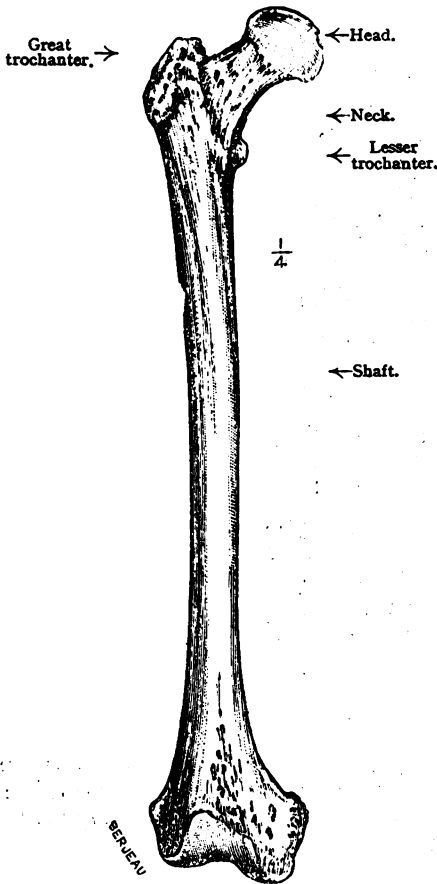


Fig. 164.—RIGHT (FEMUR) THIGH-BONE.

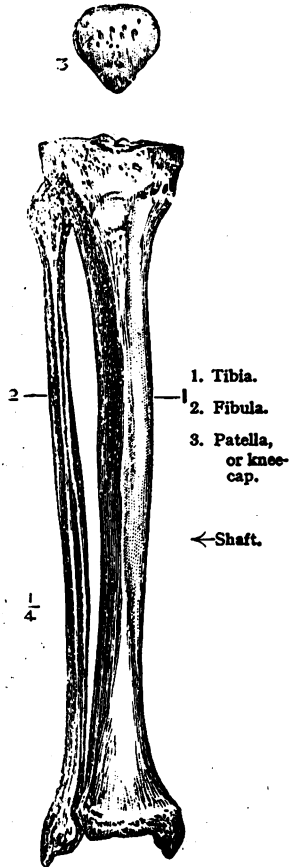


Fig. 165.—PATELLA, TIBIA AND FIBULA (right leg).

13. The leg, extending from the knee to the ankle, has two bones ; the larger one lying on the inner or great-toe side is called the **tibia**, or shin bone, upon the flat expanded head of which rests the lower end of the thigh bone ; the more slender one, on the outside, is called the **fibula**.

The articulation of the tibia to the femur admits of a hinge movement of the leg on the thigh.

14. The construction of the foot is like that of the hand ; it has three rows of bones ; seven short strong ones, called the **tarsus**, in the ankle ; secondly, a row of longer ones, called the **meta-tarsus**, corresponding to the sole of the foot and instep ; and, lastly, three small bones for each of the four outer toes and two for each great toe, called the **phalanges**.

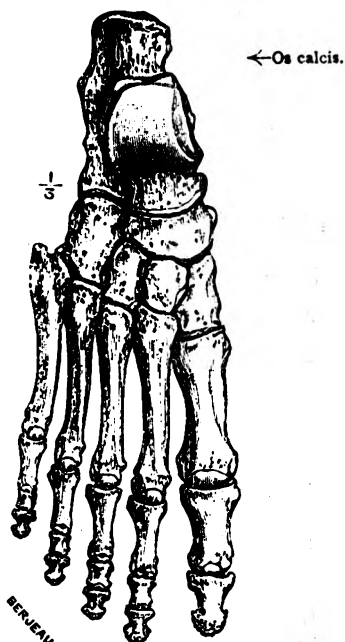


Fig. 166.—BONES OF THE RIGHT FOOT.

The bones of the foot are placed in such a way as to form an arch, giving strength and elasticity. The heel is formed by the largest bone of the tarsus, the **os calcis**, projecting behind the junction with the tibia.

54. THE MUSCULAR SYSTEM

1. **Muscles** are the red flesh of the body. They are made up of a number of muscular fibres, which are collected together in bands or bundles. They pass in most cases from one bone to another, and are usually attached to these bones by means of **tendons**. The muscles have the power of contracting or shortening their length, and thereby moving the bones to which they are attached. In this manner the limbs and different parts of the body are made to move.

There are two kinds of muscles, **voluntary** and **involuntary**. The former are under the influence of the will, and by their means the body and limbs are moved. The latter are not under the control of the will, and are mostly concerned with the action of the internal organs of circulation and digestion. The muscles connected with the mechanism of breathing are, to a certain extent, under control of the will, but perform their work under ordinary circumstances involuntarily.

2. For every muscle, or group of muscles, which performs a certain movement, there is another muscle, or group of muscles, which performs the opposite movement; such muscles are said to be **antagonistic**. It is by the due regulation of these antagonistic muscles that controlled movements are performed.
3. The muscles are also classified into various groups, according to the movements they perform, as follows:—**flexors** and **extensors**, which bend or stretch respectively the limbs or trunk, or the limbs on the trunk; **adductors** and **abductors**, which draw the limbs to or carry them outwards from the trunk; **pronators** and **supinators**, which turn the hand into *pronation* or *supination* (palm turned downward or upward respectively, or in a corresponding direction with reference to the position of the arm); **rotators**, which rotate the limbs.

55. THE ORGANS OF THE THORAX AND ABDOMEN

1. There are two large cavities in the body—the chest or thorax—and the belly, or abdomen.

The **thorax** is separated from the abdomen by the diaphragm, which forms the floor of the thorax and the roof of the abdomen. The **diaphragm** is a large flat dome-shaped muscle attached at its edges to the lower ribs and spine, and arched upwards. It is pierced by the gullet and large blood vessels. The diaphragm is specially concerned with the action of breathing. The two lungs and the heart are situated in the thorax, filling it entirely, together with the blood vessels and the gullet, which pass through it, and the windpipe, or **trachea**, which communicates with the lungs. The heart is situated in front, with its apex on the left side and pointing downwards to the left.

2. The **abdomen**, the walls of which are formed chiefly of muscles, contains the stomach, the bowels or intestines, the liver, spleen, pancreas, kidneys and bladder. The **liver**, a very large organ, is placed just below the diaphragm on the right side. The **stomach** is close under the diaphragm on the left side, and varies in size according to whether it is empty

or full. The **pancreas**, or **sweetbread**, lies across the front of the spine just above the level of the navel. The **spleen**, an organ concerned in the formation of the blood, is placed behind the stomach and close under the diaphragm. The **kidneys** are situated at the back of the abdomen, one on each side of the back-bone and close to it, just above the level of the waist; they communicate by means of two tubes with

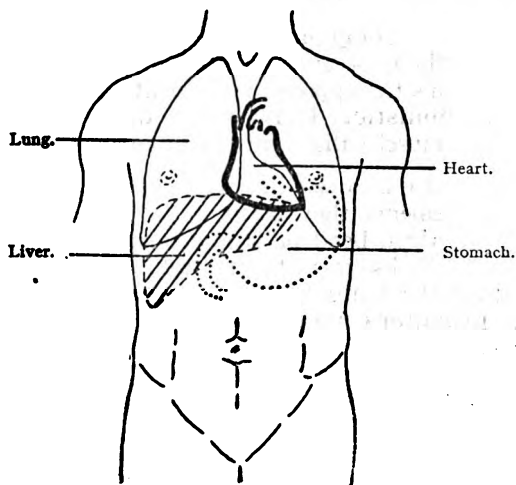


Fig. 167.—POSITION OF ORGANS IN THORAX AND ABDOMEN (seen from the front).

the **bladder**, which is quite low down in the middle of the front part of the pelvis. The bowels, consisting of the **small** and **large intestines**, fill up practically the whole of the remaining space in the abdomen.

56. THE CIRCULATORY SYSTEM

1. The organs of circulation are the means by which nourishment and oxygen are carried to all parts of the body, and waste matters carried to places where they are to be got rid of. They consist of the heart and blood vessels, and contain blood.

The **heart** is a muscular pump, about the size of a clenched fist. It is divided into a right and left half, separated by a partition, so that nothing can pass directly from one side to the other.

Each half is divided into an upper, thin-walled chamber, called an **auricle**, and a lower thick-walled chamber, called a

ventricle. There is a valve between each auricle and ventricle which allows the blood to pass in one direction only—namely, from the auricle to the ventricle. These chambers of the heart contract about 72 times to the minute when the body is at rest, and so force the blood into the arteries (described below), and through them to all parts of the body. The blood is returned to the heart by means of the veins. A continuous circulation is thus kept up.

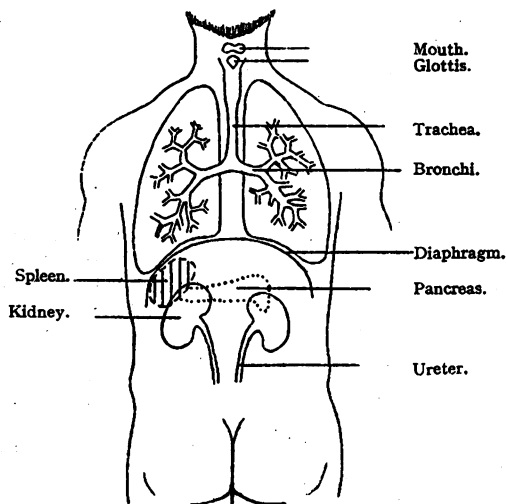


Fig. 168.—POSITION OF ORGANS IN THORAX AND ABDOMEN
(seen from behind)

2. The **blood vessels** are tubes containing blood, extending from the heart to every part of the body.

There are three kinds of blood vessels—arteries, capillaries and veins.

Arteries are strong, thick-walled tubes leading from the ventricles (of the heart), they branch outwards as they proceed to the various parts of the body and, becoming smaller, divide into very small vessels called **capillaries**. The blood in the arteries contains dissolved nutriment from the digestive system, and oxygen from the lungs. The walls of the capillaries are so thin that this nutriment (including the oxygen) is enabled to pass through them from the blood into the tissues of the body, while the impurities from the tissues pass into and are carried by the blood into the veins.

The **capillaries** form a close network all over the body, and, gradually collecting together and getting larger, they become veins.

The veins, thin-walled tubes, commencing thus in the capillaries, become fewer in number and larger in size as they get nearer the heart, until they end in the large veins which open into the auricles (of the heart). There are a number of valves

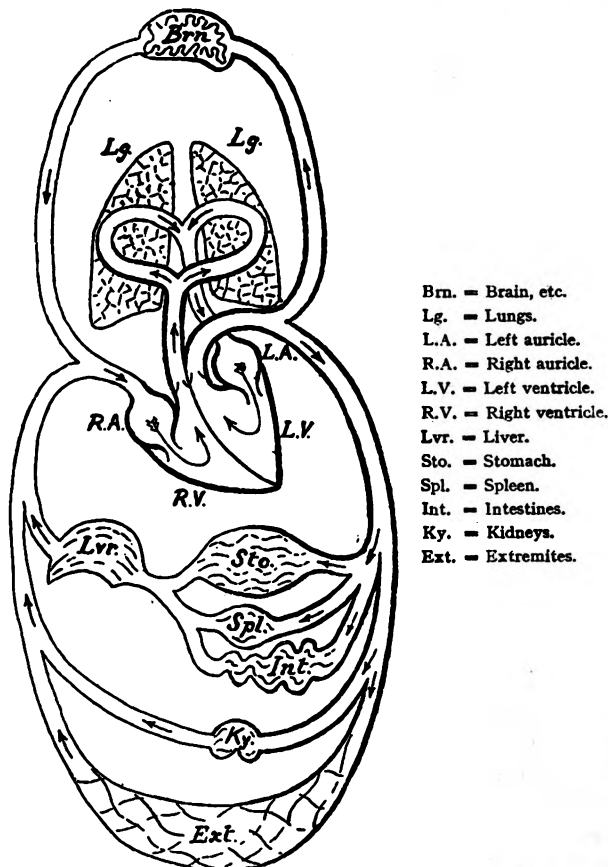


Fig. 169.—DIAGRAM ILLUSTRATING THE CIRCULATION OF THE BLOOD

in the veins, which allow the blood to pass freely towards the heart, but prevent it from flowing backwards towards the capillaries.

3. Starting from the left ventricle, the blood, containing nourishment from the food and oxygen from the air in the lungs, is pumped by the contraction of the ventricle into the arteries, and thence into the capillaries, where it travels comparatively slowly, and gives up nourishment and oxygen to the tissues,

receiving from them in exchange carbonic acid and other waste matters. It then passes into the veins, and returns through them to the right auricle. From the auricle it then passes into the right ventricle, and is pumped by its contraction into the pulmonary artery leading into the lungs and so into the capillaries of the lungs. In these capillaries the blood gives up the carbonic acid, which it has received from the tissues, to be eliminated by exhalation, and receives oxygen which the lungs have obtained from the air by inhalation. The aerated blood returns through the veins of the lungs to the left auricle, and thence to the left ventricle to recommence its course through the body, as above described.

The blood, when passing through the arteries of the general circulation, is of a bright red colour, and, when passing through the veins, is of a dark purple colour.

The pumping action of the heart produces a wave through the arteries, which can be felt where they come near the surface of the body, as at the wrist. This wave or beat is called the pulse, the beats corresponding to the contraction or beat of the heart. In the veins there is no beat or pulse, as the force of the current is expended in passing through the capillaries; so that the blood flows in the veins in a steady even stream.

57. THE RESPIRATORY SYSTEM.

1. The object of respiration, or breathing, is to take air into the lungs, so that oxygen gas from the air may be taken into the blood, and certain waste gases (of which carbonic acid is the chief) and watery vapour may pass from the blood into the air in the lungs, and so be breathed out of the body.

The organs of respiration are—the **trachea**, or windpipe, and the **lungs**.

The **trachea** is a stout tube through which the air, which is drawn in through the nose or mouth, passes into and out of the lungs. Its upper part, the **larynx**, is the organ of voice, and opens into the back of the mouth and nose. The windpipe can be felt in the throat under the skin, where it lies immediately in front of the gullet. In the thorax it divides into two tubes, the **bronchi**.

There is a flap, called the **epiglottis**, at the upper opening of the larynx, which covers it, and prevents food from passing into the windpipe when swallowing.

The bronchi are **strong** tubes leading from the windpipe to each lung. In the lungs the bronchi branch out in all directions, becoming smaller and their walls thinner as they proceed to their closed endings, the **air cells**.

The two lungs lie in the cavity of the thorax, one on either side. Each consists of a mass of minute, extremely thin-walled cells, the air cells, which are the blind endings of the bronchial tubes. In the walls of the air cells are spread a network of capillaries. The air cells communicate directly with the external air through the bronchi, windpipe, larynx, mouth, and nose, and with the blood through their thin walls.

2. The act of respiration consists of :—Inspiration, or drawing in of air to the lungs, immediately followed by expiration,

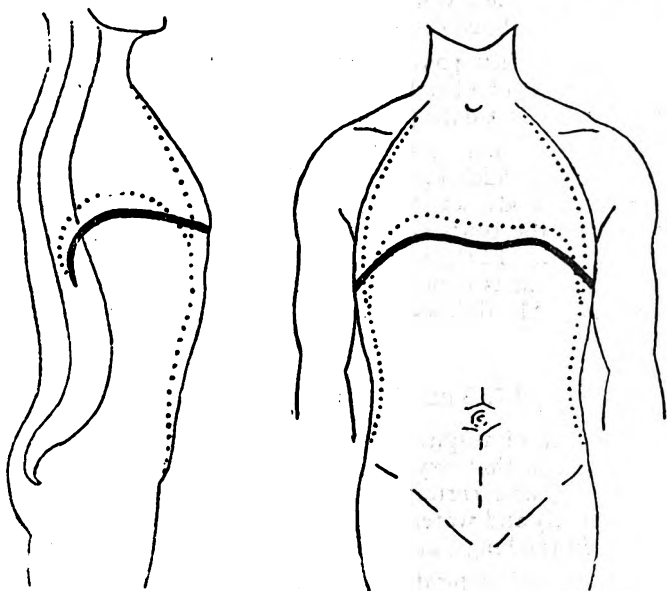


Fig. 170.—DIAGRAMS SHOWING A SIDE AND FRONT VIEW OF THE DESCENT OF THE DIAPHRAGM AND ENLARGEMENT OF THORAX AND ABDOMEN IN INSPIRATION (continuous lines) AND THE ASCENT OF THE DIAPHRAGM AND DIMINUTION OF THE THORAX AND ABDOMEN IN EXPIRATION (dotted lines).

or breathing out of air *from* the lungs, followed by a slight pause before the next inspiration is taken.

Under normal conditions of health about one complete respiration is taken to four heart beats.

The act of respiration is carried out in the following way :—

There are certain muscles by the action of which the thorax is enlarged. One of these, the **diaphragm**, forming the floor of the thorax, when not in action, is arched well upwards. When in action, and its fibres contracted, it becomes flattened,

pressing downward on the abdominal viscera, which thus push the abdomen outwards. The cavity of the thorax is thus enlarged downward. There are other muscles attached to the ribs which raise them up, and so, owing to their shape, outwards at the same time, thus increasing the size of the chest from front to rear and from side to side. While the cavity of the chest is thus being enlarged, the air rushes in through the nostrils or mouth, and passes down the windpipe and bronchial tubes into the lungs.

The air remains long enough in the air cells of the lungs to allow oxygen to pass through the thin walls of the capillaries into the blood.

The lungs are very elastic, and, on the cessation of the act of inspiration, by their elasticity, together with the relaxation of the muscles employed, the cavity of the thorax is diminished and the air is forced out.

3. The muscles which raise the ribs in the act of inspiration are the **external intercostals**, which are placed in the spaces between the ribs and connect each rib to the one next below it by fibres which pass diagonally downward and forward.

The cavity of the thorax is therefore enlarged in ordinary normal inspiration by means of the diaphragm and the intercostals. In increased and forced inspiration the muscles which connect the ribs with parts of the spine above them, and with the shoulder bones, are brought into play to assist in raising the ribs, the spine and the shoulder blades being fixed by the muscles of the back. Among the muscles employed in this increased inspiration may be mentioned the **scaleni** and the **pectoralis minor** and, in addition, the **sterno-cleido mastoid**, which raises the sternum when the head is fixed. (Sec. 63, 2 and 3, and Sec. 65, 2.)

In ordinary normal expiration the cavity of the thorax is diminished, on the relaxation of the muscles employed in inspiration, by the elasticity of the lungs and the cartilages of the ribs, by the action of the **internal intercostals**, and the force of gravity drawing the ribs downward. The internal intercostal fibres run downward and backward. In increased and forced expiration the abdominal muscles assist energetically by pulling the ribs downwards, and, at the same time, pressing the abdominal viscera against the under surface of the diaphragm, and so pushing the floor of the thorax upward.

It should be noted that at no time can the lungs be fully emptied of air. The air that still remains in the lungs after a forced expiration is called **residual air**, and that which is

breathed in and out of the lungs during an ordinary respiration is called **tidal air**.

It should also be noted that the bellows-like action of the chest in breathing assists to pump the blood from the right side of the heart through the lungs to the left side of the heart.

58. THE DIGESTIVE SYSTEM

1. The digestive system is made up of a number of organs the function of which is to prepare the food for absorption into the

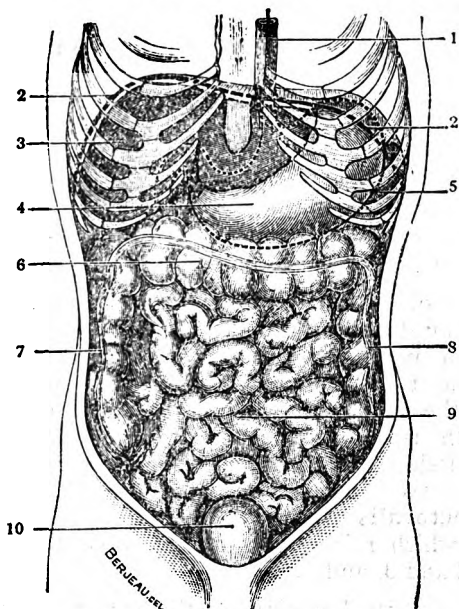


Fig. 171.—THE ABDOMINAL VISCERA.

1. Gullet. 2, 2. Cut edge of diaphragm. 3. Liver. 4. Stomach. 5. Spleen. 6. Transverse colon. 7. Ascending colon. 8. Descending colon. 9. Small intestines. 10. Bladder.

system. It consists of two portions—a long tube of varying size, called the **alimentary canal**, and the **glands**, which prepare juices to be mixed with the food for the purpose of digesting it.

The alimentary canal begins at the mouth, and ends at the lower opening of the bowel. It is about 30 feet in length.

The different parts of the alimentary canal are the mouth, gullet, or œsophagus, stomach, small and large intestines.

The glands or organs which pour juices into this canal are the

salivary glands in the mouth, the **gastric glands** in the stomach, the **liver** which is connected with the formation of bile, the **pancreas** which forms a strongly acting digestive juice, and other glands in the walls of the intestines.

2. The mastication of the food in the mouth by means of the teeth is the commencement of the digestive process. During mastication the food is not only broken up, but is mixed with the saliva (a most important part of the process), which commences to act upon it chemically. The food thus prepared in the mouth is then swallowed, and passes through the gullet into the stomach, where it is further broken up and somewhat liquefied by the action of the stomach and its juices. From the stomach it passes gradually into the intestines, where it is mixed with the bile and pancreatic juice, and further digestion takes place; the unused parts being then passed out of the body some hours after having been swallowed.

While it is passing through the stomach and intestines the nutritive portion is dissolved, and part of it is sucked through the walls of the intestines into tubes, called **lymphatics**, through which it is conveyed to the veins in the form of lymph, while part passes direct into the blood through the thin walls of the capillaries on the inside of the stomach and intestines, and passes from thence into the veins, and so into the general circulation for the nourishment of the body.

59. THE EXCRETORY SYSTEM

1. The waste matters which, as before explained, accumulate in the blood must be got rid of. The **kidneys**, the **lungs** and the **skin** are the organs of excretion which have the power of gathering these matters, gases and fluids, and eliminating them from the body. The kidneys pass out water containing waste matters from the blood, the lungs pass out foul gases and watery vapour, as already shown, and the skin is continually passing off sweat, which consists of water and impurities from the blood.

The skin not only covers and protects the body, and has the sense of feeling and touch, but also has in it a number of minute apertures, called pores, through which sweat and the natural grease which keeps the skin supple pass out. It has a layer of fat under it, which keeps in the heat of the body.

The skin also regulates the heat of the body by means of sweating, which cools down the blood; and, in order to keep the skin, and consequently the whole body, healthy, great attention should be paid to its cleanliness.

The bowels assist the above organs in casting out, with the remains of the food, certain impurities.

60. THE NERVOUS SYSTEM

1. The **nerve-centres** are the brain and spinal cord, which receive all messages from the organs of sense, and send out orders to the muscles to make them move in any desired way. The brain is the organ of thought, and has the power of directing the voluntary movements of the body.
2. The **nerves** are the connecting threads between the nerve-centres and nerve-endings, and are attached at one end to the brain, or spinal cord, and at the other end terminate in the nerve-endings, whether situated in the organs of sense or muscles. Some few of the nerves are purely *sensory*, i.e. they convey impressions to the brain. Most of them are, however, composed of both *sensory* and *motor* fibres, the former of which convey impressions to the nerve-centres, and the latter convey orders from the nerve-centres to the muscles, directing them to move.

The nervous system thus has a double duty to perform, viz. to receive impressions conveyed through the senses, and to stimulate the muscles, both voluntary and involuntary, to action.

61. GENERAL CONSIDERATIONS REGARDING BODILY EXERCISE

1. The first object of physical training is, as before stated, the attainment of such a state of health and general physical fitness that all the organs of the body are vigorous and healthy, and capable of performing the work required of them. The only means we have of acting on the internal organs is through the agency of the muscles.

The object, then, of employing the muscles in all physical training and gymnastic exercises is not, as is so often supposed, merely for the sake of muscular development (which, for itself alone, is a matter of secondary importance), but for the effects, direct and indirect, on the harmonious development and co-ordinate action of all the organs of the body and of the body as a whole.

2. Every movement of the body is made by means of the muscles, which are stimulated to action by the nerves. The action of a muscle is accompanied by the combustion of certain materials which are supplied by the blood. The waste products of this combustion (carbonic acid, urea, water, etc.) are eliminated from the system in due course by means of the lungs, kidneys and skin. The loss of the materials oxidized, or burned, in the process of causing the action of the muscles has to be made good by an increase of nourishment. This

nourishment (obtained originally from the food) is carried to the muscles and neighbouring parts, including the bones, joints, ligaments, etc., by means of the blood, the circulation of which is automatically increased by the movement of the muscles.

The continued drawing to the muscles of this fresh nourishment gradually strengthens and develops them, providing that the supply of nourishment is kept up by a sufficiency of food.

3. There are three different terms used in physical training to denote the way in which work is performed by a muscle. viz. :—

- i. *Positive* action, e.g. raising a weight (or the body) up, or *overcoming* resistance. The length of the muscle in this action is continually shortening, until the limit is reached.
- ii. *Negative* action, e.g. lowering a weight steadily downward or *giving up* to resistance. When acting negatively the muscle, although working the whole time, is gradually being lengthened.
- iii. *Static* contraction, e.g. maintaining the weight in a *stationary* position above the ground. In this action the muscle works while maintaining a fixed length somewhere between its greatest and least length.

4. By frequent shortening of a muscle its average length can be diminished, and by frequent stretching its average length can be increased. It is owing to this law of nature that many of the occupations of daily life (e.g. bending over a desk or work bench, etc.) cause some muscles to become unduly long, and others unduly short; the result being a bad carriage of the body, and possible injurious effect on the skeleton and internal organs. In physical training, advantage is taken of this same law to stretch the unduly shortened muscles and to shorten those which are too long; and by the judicious employment of exercises of varying effects a good average length is obtained for all the important muscles, and a correct carriage of the body is thereby obtained, so that the internal organs are placed under the best possible conditions for performing their particular functions.
5. The increased flow of blood that is drawn to muscles in action necessitates an increased action of the heart to pump the blood through the body. The heart is thus exercised, and gains strength from this exercise in the same way as the other muscles, as long as no undue strain is put upon it. As the heart gains strength it becomes capable of more work, and exercises which would at first have been too severe for it, will, as it becomes stronger, not only be within its capacity, but will

serve to strengthen it further. This is one of the reasons why a steady and very gradual progression in the exercises employed in physical training is so important.

6. When a muscle is stimulated the resulting contraction is accompanied by a combustion of some of its material. This combustion, or chemical change, requires a supply of oxygen from the blood, and is accompanied by the production of heat, carbonic acid and other waste products; these are taken up and removed by the blood. Muscular activity is thus accompanied by an increase in the production of carbonic acid and heat, and the breathing is in consequence increased so that the additional carbonic acid and watery vapour, together with the surplus heat, may be discharged from the lungs. The increased breathing also enables the body to obtain more oxygen and the heart beat is at the same time quickened, so that the blood is enabled the more rapidly to pass through the lungs and there give up carbonic acid and take up oxygen.

A good "wind" does not depend on the *size* of the chest, but on the ability of the heart to regulate its beats so that the blood may be sent rapidly through the lungs in accordance with the needs of the body. If the lungs and the heart do not work properly together during exercise, breathlessness is the result, and if the exercise be too prolonged the heart may be overstrained and damaged. The natural free movements of the chest and abdomen help to pump the blood from one side of the heart to the other, and for this reason breathing should never be restricted by attempts to hold the chest in a distended and rigid position. By progressive exercise the harmonious working of the heart and lungs during exercise can be improved and the power of endurance developed.

Over-distension of the chest is injurious, as it is liable to diminish the elasticity of the lungs and render them less efficient. But exercise performed with a good carriage of the spinal column and directed towards securing the co-ordinate working of the heart and lungs is in the highest degree beneficial. The judicious and progressive employment of marching, running, jumping, and kindred exercises is the best means of obtaining this co-ordination.

One of the most marked effects of muscular work is the increased warmth of the body. The excess of heat produced is discharged from the body by sweating and radiation as the warm blood flushes the skin, and by more rapid breathing. If the body becomes too hot, discomfort and over fatigue will result, and injury may even be produced. Light clothing should therefore be worn during exercise so that the loss of surplus heat may be facilitated, but a sufficiency of clothing should be

added after exercise to prevent the body from cooling too rapidly (*see* Sec. 9, 5).

7. The nervous system regulates the work performed by all the organs of the body. The internal organs perform their work without our being conscious of, or able directly to control, the nervous stimulus ; but, with regard to voluntary muscular work, when a new movement is first learned, the brain consciously directs the action of the muscles through the nerves. By frequent practice, such movements, which were at first difficult, become easy, and may even be performed without conscious effort of the brain. In such cases the spinal cord takes the place originally taken by the brain, and communicates the necessary stimulus through the nerves to the muscles by what is called *reflex* action. In walking, for example, which requires the co-ordinate action of a large number of muscles, and which is originally learned with much difficulty, the movements are eventually performed so easily that they can even be executed unconsciously, and while the brain is fully occupied with other matters.

The training of the nervous system is therefore effected by means of physical exercises, and especially by a judicious employment of old and new exercises.

8. From the foregoing remarks it will be seen that all exercise necessitates the combustion of materials contained in the body. This consumption of material produces a want (as shown by the increased appetite) which has to be supplied by means of the food. Muscular exercise, however, not only creates this need for increased food, but also has a stimulating effect on the organs connected with the process of digesting and assimilating it.

62. ACTION OF MUSCLES OF THE SPINE

1. Under this heading are included those muscles situated on the back of the trunk, which directly effect the movements and carriage of the spine.

Erector spinæ is the name given to a deep layer of muscles on the back, the fibres of which run approximately parallel to the spinal column, and have their attachments on the sacrum, the pelvis, the vertebræ, the ribs and the skull. They serve to hold the trunk erect, and, when it is inclined or bent forward, they, together with the gluteus maximus and hamstring muscles, prevent it from *falling* forward, hold it in position, and bring it back again to the erect position.

2. The **complexus** and the **splenii** muscles, situated at the back of the neck, are attached to the upper part of the spine

and back of the skull. They raise the chin by drawing the back of the skull downward, and, when the spine is inclined or bent forward, they prevent the head and neck from *falling* forward.

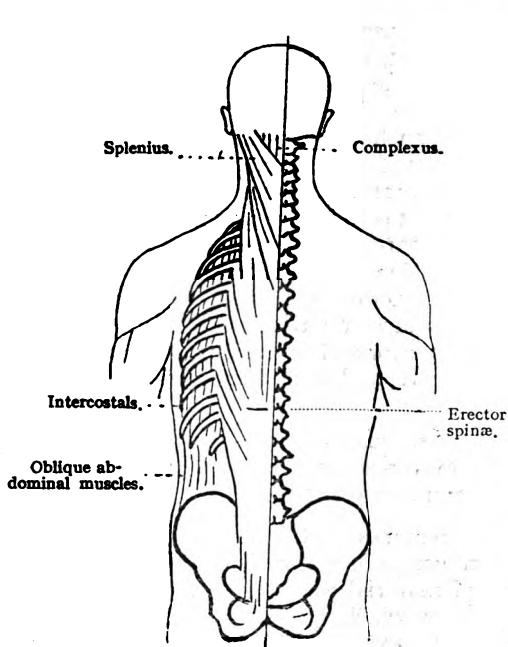


FIG. 172.

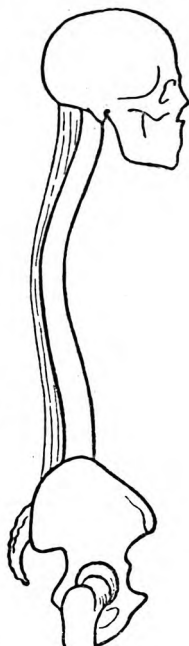


FIG. 173.

Figs. 172 and 173.—MUSCLES OF THE SPINE (back and side view), ERECTOR SPINÆ, etc.

63. ACTION OF MUSCLES OF THE NECK

1. The **longus colli** and **rectus capitis anticus** are situated in front of the cervical portion of the spine. The former is attached to all the vertebræ from the third dorsal vertebra to the atlas; it straightens (or rather lessens) the cervical curve. The latter is attached to the cervical vertebra and the base of the skull in front of the spine; it lowers the chin, drawing it in towards the spine.
2. The **scaleni** muscles are attached at one end to the two upper ribs, and at the other end to the transverse processes of the cervical vertebrae. When the neck is fixed by other muscles they help to raise the ribs.
3. The **sterno-cleido mastoid** is attached at one end to the

top of the sternum and inner end of the clavicle, and at the other end to the mastoid process of the skull, just behind the ear. When both of these muscles are used they either raise the chest or bend the head and neck forward, according to whether the head or the chest is fixed.

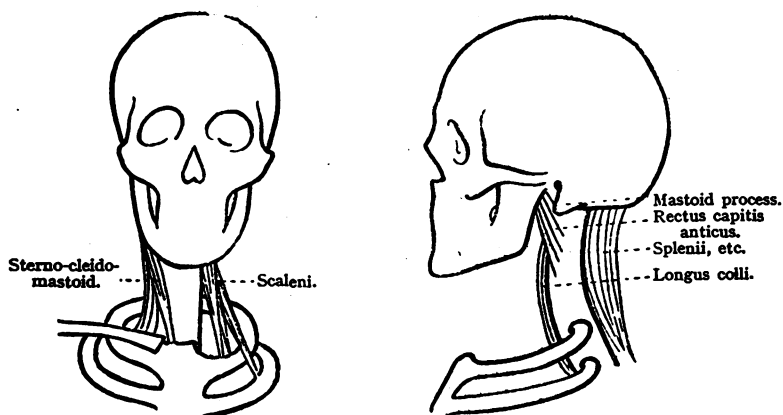


Fig. 174.—MUSCLES OF THE NECK (front and side view).

Turning and bending the head sideways is accomplished by the action of the above muscles, together with the complexus and splenii.

64. ACTION OF MUSCLES OF THE ABDOMEN

1. The **rectus abdominis** is attached at one end to the lower edge of the front part of the thorax, and at the other end to the front edge of the pelvis. The right and left portions of this muscle are separated by a tendinous substance, called the **linea alba**. The muscle is also intersected by three or more horizontal tendons. When the pelvis is fixed this muscle draws the thorax towards it, and when the thorax is fixed it raises the front part of the pelvis. In both cases the back is thereby rounded.
2. The **external oblique** (right side) is attached at one end to the outer side of the lower ribs, its rear fibres run downward (some of them almost vertically) and forward to the top outer edge of the pelvis (hip bone), most of the remaining fibres run diagonally forward and downward, and are attached to a tendinous sheath, which surrounds the rectus muscle. The **internal oblique** of the left side (which lies under the external oblique of that side) is attached to the left side of the tendinous sheath of the rectus muscle, and its fibres run thence diagonally

downward and backward to the inner edge of the top left side of the pelvis.

The action of these muscles (the right external and left internal oblique), working together, is, when the pelvis is fixed, to draw the thorax forward, downward and sideways to the left. When the external and internal oblique muscles of the same side of the body are together brought into action they bend the trunk sideways.

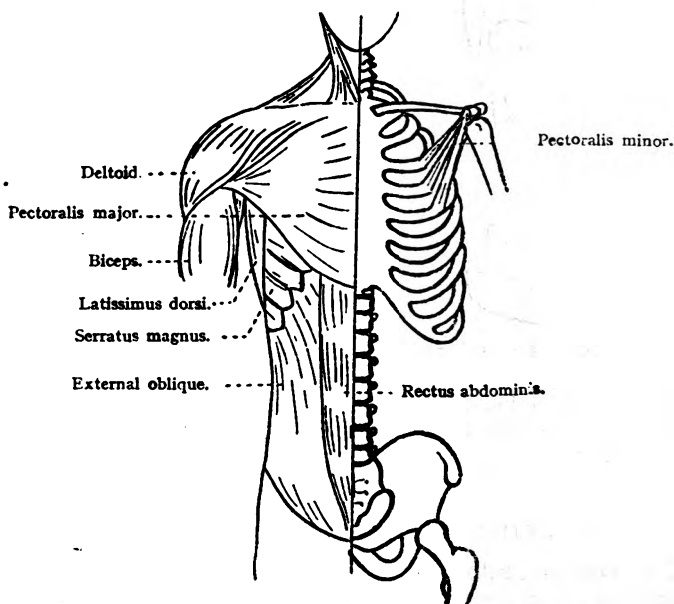


Fig. 175.—MUSCLES OF THE TRUNK (front view).

3. Another abdominal muscle, the **transversalis**, is situated underneath the internal oblique on both sides, its fibres run horizontally with reference to the erect position of the trunk ; and, when it contracts, it exerts a pressure together with the other abdominal muscles on the abdominal viscera.

65. ACTION OF MUSCLES OF THE SHOULDER AND ARM

1. The **rhomboid** (lying underneath the trapezius) is attached at one end of the upper dorsal vertebræ ; its fibres pass thence diagonally downward to the inner edge of the scapula. Its action is to draw the shoulder blades backwards towards the spine.

2. The **pectoralis minor** (lying underneath the pectoralis major) is attached at one end to the front of three of the upper ribs, and passes upwards from them to the coracoid process of the scapula. When the ribs are fixed it draws the upper part of the scapula forward and downward, and when the scapula is fixed it helps to raise the ribs.

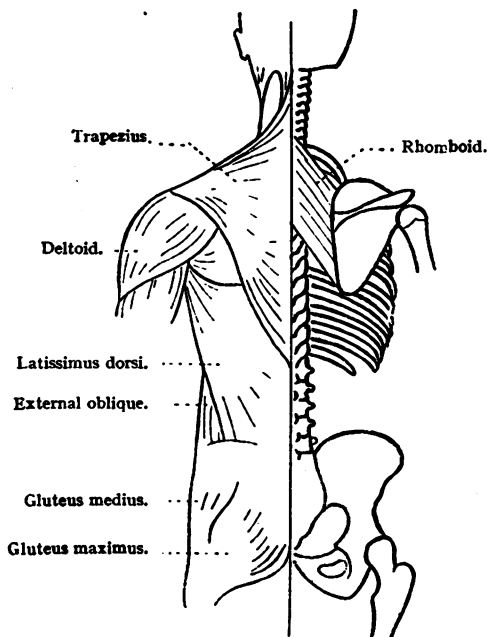


Fig. 176.—MUSCLES OF THE TRUNK (back view).

3. One end of the **trapezius** muscle is attached to the back of the skull, and to the cervical and dorsal vertebræ. From this attachment its fibres converge, and are fixed at the other end to the spine of the scapula and the outer end of the clavicle. The upper fibres pull the outer angle of the scapula upward, the lower fibres draw the inner end of its spine downward; the result, when they act together, being a rotation of the scapula. Some of its fibres assist the rhomboid in drawing the shoulder blades backward towards the spine.
4. One end of the **serratus magnus** is attached to the side of the upper nine ribs; its fibres pass along the side and back of the thorax underneath the scapula to the inner edge of which they are fixed. It draws the scapula forward away from the spinal column, and, in doing so, rotates it in the same manner as the trapezius.

5. One end of the **deltoid** is attached to the outer end of the clavicle and the spine of the scapula; its fibres converge towards the other end, where they are attached to the middle of the humerus on its outer side. It raises the humerus forward or sideways, level with the shoulder, until stopped by the structure of the joint, and, together with several other muscles which run from the scapula to the humerus, fixes the arm in this position. These last-mentioned muscles also assist in rotating the humerus. The back portion of the deltoid raises the humerus backward.

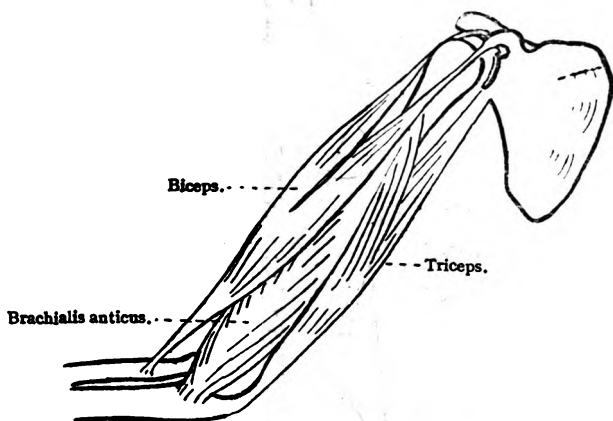


Fig. 177.—MUSCLES OF THE ARM.

6. The **pectoralis major** is attached to the front inner half of the clavicle and the whole of the sternum; its fibres converge, and the other end is attached to the outside of the upper part of the shaft of the humerus. It draws the humerus forward across the body, and, when the arm is raised above the shoulder, it draws it down. When the arm is fixed above the shoulder it raises the ribs.
7. One end of the **latissimus dorsi** is attached to the lower dorsal vertebræ, all the lumbar vertebræ, the sacrum and the rear margin of the pelvis; its fibres converge from these attachments, and, running diagonally upward, are joined by some few fibres which are attached to the lower ribs, and the other end is attached to the front of the humerus just inside the pectoral attachment. It draws the humerus downward and backward, and, in doing so, rotates it inwards.
8. The **biceps** arises (as its name implies) from two attachments, both of which are on the scapula, viz., the coracoid process and a point just above the junction of the humerus with the

scapula. Its fibres pass along the front of the humerus, and the other end is attached to a small process on the inside of the radius. It turns the hand into supination and bends the forearm on the upper arm.

9. One end of the **brachialis anticus** is attached to the front lower part of the humerus, and the other end to the front upper end of the ulnar, just below its joint with the humerus. It assists in bending the arm.
10. The **triceps** arises from three attachments, one of which is on the scapula just below the shoulder joint; the other two are on the rear side of the humerus. The other end of this muscle is attached to the olecranon. It straightens the forearm on the upper arm.
11. A number of muscles are situated on the forearm; most of them are connected with the rotation of the radius round the ulna, and the various movements of the hand and fingers.

66. ACTION OF MUSCLES OF THE LEG

1. The **gluteus maximus** is attached to the back of the pelvis and the sacrum, and the principle portion of this muscle is attached at the other end to the back of the shaft of the femur, a little below the great trochanter. It moves the femur backward and rotates it outward.
2. The upper end of the **gluteus medius** muscle is attached to the outside of the pelvis just below the brim. Its fibres converge towards the other end, which is attached to the great trochanter (on the femur). It raises the leg sideways (abduction), and its front fibres rotate it inwards.
3. The **gluteus minimus** muscle, lying underneath the gluteus medius, is attached at one end to the outside of the pelvis just below the attachment of the gluteus medius. Its fibres converge, and the other end is attached to the great trochanter. Its action is the same as that of the gluteus medius.
4. The **ilio-psoas** is a double muscle consisting of the **psoas magnus** and the **iliacus**. The upper end of the former is attached to the front of the twelfth dorsal and all the lumbar vertebræ, and the upper end of the latter to the inner surface of the back and side of the pelvis. The lower ends of these two muscles run together over the front edge of the pelvis to their attachment on the lesser trochanter (on the inside of the femur). When the pelvis is fixed, the action of this double muscle is to bend the thigh on the pelvis, and, when the femur is fixed, it bends the trunk on the thigh.

5. There are several muscles which are attached at one end to the lower and front part of the pelvis, and at the other end to the inside of the femur, somewhat to the rear side of it. They are called the **adductors of the thigh**, and, as their name indicates, they carry the thigh inwards, at the same time they tend to rotate it outwards.
6. The **quadriceps extensor (femoris)** is a four-headed muscle situated on the front of the thigh. Its heads are attached to the front of the pelvis and to the front and sides of the femur. Its fibres run together into a tendon, which encloses the patella, and thence proceeds to its attachment on the front of the tibia. The principal action of this muscle is to extend the leg on the thigh; it also, owing to its attachment to the pelvis, assists the action of the ilio-psoas.

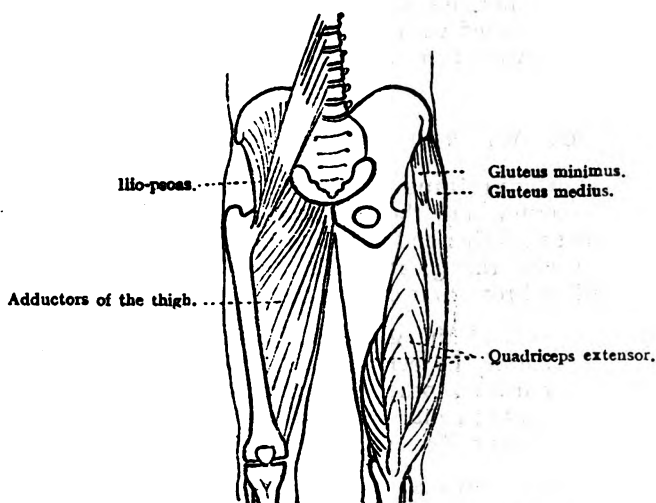


Fig. 178.—MUSCLES OF THE LEG (front view).

7. The **hamstring muscles**, situated on the back of the thigh, are attached at one end to the lower back part of the pelvis (one head is attached to the femur), and at the other end to the bones of the lower leg, just below and behind the knee on both sides of the leg. The action of these muscles is to bend the leg on the thigh, and, when the leg is fixed, to rotate the pelvis backwards on the femur. When the leg is extended, they limit the forward rotation of the pelvis on the hip joint, or the forward raising of the leg.
8. The **muscles of the calf** arise from the back part of the lower end of the femur, and from the back of the tibia and fibula,

and their fibres are attached at the other end by means of a single strong tendon (the tendo Achillis) to the back of the heel. They extend the foot on the leg, and if, therefore, the foot is supported on the ground, they raise the body on the toes.

A number of other muscles connected with the various movements of the foot and toes are situated on the leg.

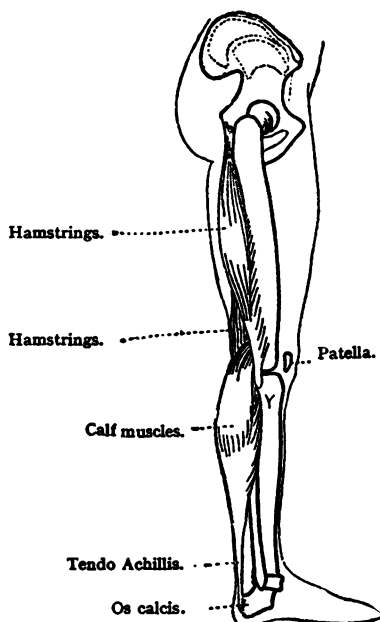


Fig. 179.—MUSCLES OF THE LEG (side view).

67. ACTION OF THE MUSCLES IN TYPICAL POSITIONS AND EXERCISES, ETC.

1. A few typical exercises have been selected and included in the following paragraphs for the purpose of indicating the muscles employed in, and other physiological considerations affecting, the various positions and movements. The descriptions are not intended to be exhaustive, but, if read in conjunction with the explanations of the various exercises and groups of exercises included in Chapter VII, they should be of some value in assisting the instructor in the application of the different exercises according to the requirements of the training.

Consideration of the Position of Attention.

1. The erect position is maintained partly by the construction of the skeleton and partly by the action of certain muscles. The muscles employed must be sufficiently strong and of normal average length, in order that the position may be maintained

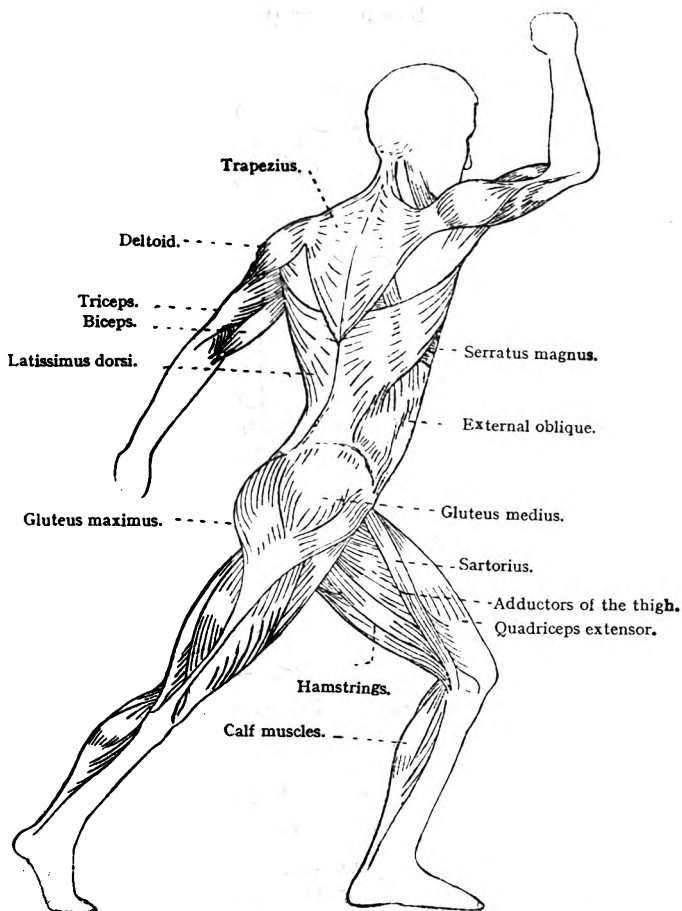


Fig. 180.—SURFACE MUSCLES OF THE BODY (general view).

properly and without undue strain. If the muscles do not fulfil these requirements a deviation from the normal erect position will be the result. The position of *Attention* should be regarded as the correct position to be aimed at in commencing and finishing an exercise, and, in endeavouring to

acquire this position, special attention should be paid to the position of the pelvis.

In the erect position the pelvis rests on the heads of the two thigh bones, and can be inclined on these points forward or backward. If it is inclined forward the spine is thrown forward, and, in order to correct the balance, the upper part of

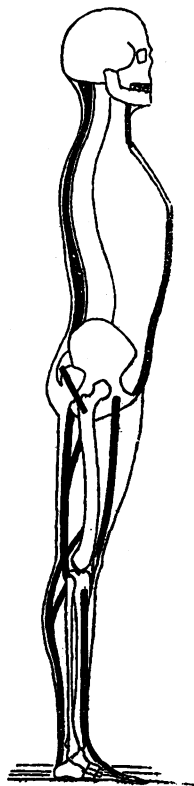


Fig. 181.—DIAGRAM ILLUSTRATING THE GENERAL ACTION OF THE CHIEF MUSCLES EMPLOYED IN MAINTAINING THE POSITION OF ATTENTION.

the trunk is thrown back, with the result that the back is unduly hollowed in the lumbar region. If it is inclined backward the spine is thrown back, and the correction of the balance is then obtained by bringing the upper part of the trunk forward, and thus rounding the back.

It will thus be seen that an erect position of the spine cannot be obtained without a correct inclination of the pelvis with reference to the hip joints, and that an incorrect inclination

of the pelvis is the cause of the two opposite faults of unduly hollow back and round back.

The hamstring muscles influence this inclination. If their tone is not good and they are weak, they allow the pelvis to incline forward, and, as has been shown, produce hollow back. If they are too much contracted, they, by holding the pelvis too far back, produce round back. In the former case the abdominal muscles become slack, and in the latter case they become over contracted.

The above mentioned faulty positions of the pelvis thus affect the whole spine, and the most harmful results of these faults are felt in the dorsal region. The mobility and capacity of the thorax is, to a great extent, dependent on the mobility and general form of this region of the spine—if it is rounded and stiff the ribs will be permanently depressed, and if it is straightened the chest will be raised, and the walls of the thorax in a better position for free movement. It is therefore of the utmost importance that the spine should not become fixed in a bad position, as would be the case if the above-named faults were not corrected.

A good carriage of the shoulders is also closely connected with the carriage of the spine. If the back is rounded the shoulders will fall forward, and their weight, and that of the arms, will thereby be thrown forward on to the chest, and will tend to still further round the back, and limit the mobility of the ribs.

The carriage of the cervical portion of the spine determines the position of the head, and also influences the carriage of the remainder of the spine and the position of the chest. If the neck is inclined forward, the chin will be poked forward and the back rounded. If the neck is straightened and carried backwards, the back will be straightened, and a better position of the chest obtained.

3. **Heels raising and Knees bending.**—The heels are raised by the calf muscles, and, as soon as the knees are the least bit bent, the body is lowered by the force of gravity, which is resisted by the action of the *quadriceps extensor* working *negatively*. The knees are, at the same time, kept pressed outwards by means of the *gluteal* muscles. In stretching the knees after the bending, the *gluteus maximus* and *quadriceps extensor* act *positively*.
4. **Head bending backward.**—The *rectus capitis anticus* holds the chin in, while the *longus colli* straightens the cervical curve, and prevents it from being bent by the action of the *splenii* and *complexus*, which actually perform the movement of drawing the neck backward. A result of this movement

is that the *sterno-cleido mastoid* and *scaleni* muscles are stretched, and, in consequence, raise the ribs.

5. **Arms bend.**—The arm is bent by the *biceps* and *brachialis anticus*, and the humerus is rotated outward by some of the muscles which run from the scapula to the humerus (Sec. 65, 6). To make it possible for these latter muscles to work in this way, the scapula is fixed and drawn towards the spine by means of the *rhomboid*, assisted by the *trapezius*.
6. **Arms raising sideways and upward.**—The arm is raised to the level of the shoulder by means of the *deltoid*, and the scapula is rotated by the combined action of the *trapezius* and *serratus magnus* (see Sec. 65, 3 and 4). These two movements are performed at the same time, and the action of the muscles is continued, after the forearm is turned into supination, until the arm is fully stretched above the head. Owing to the position of the attachments of the pectorals, the ribs are raised upward by the upward movement of the arms; the higher the arms are raised, and the more fully they are stretched, the greater will be the raising of the ribs. It is for this reason that the *Arm raising* exercises are used as *Corrective* exercises.
7. **Undergr., Overgr., etc.—Arms bend.**—In the hanging position the grip is maintained by the action of some of the muscles of the forearm. From this position the body is raised partly by means of the *biceps* and *brachialis anticus*, and partly by the *latissimus dorsi* and the *pectorals*. The *rhomboid* also assists the movement by drawing the rotated scapula backward towards the spine. By keeping the elbows well back, as much as possible of the work is thrown on the *latissimus dorsi* rather than on the *pectorals*. The head is kept back during this exercise by the action of the muscles employed in **Head bending backward** counteracting the tendency experienced to let the head and chin go forward, and the back to be rounded, as would be the case if the *pectorals* were allowed full play without the counteraction of the muscles of the back.
8. **Trunk bending sideways.**—The movement is started by the action of the *external* and *internal oblique* of the side towards which the trunk is bent. As soon as the trunk leaves the upright position, the corresponding muscles on the opposite side, together with the *erector spine* of that side, come into play to counteract the force of gravity which would cause the body to fall. In returning to the erect position the same muscles draw the trunk back again by *positive* action.
9. **Trunk bending backward.**—The movement is started by the action of the muscles of the back. As soon as the movement is commenced, the *abdominal muscles*, particularly the

rectus abdominis, are brought into action *negatively* to limit the movement, and prevent the trunk from falling. The *positive* action of the abdominal muscles returns the trunk to the erect position.

10. **Leg raising and Knee raising.**—The action of the *abdominal muscles* prevents the hollowing of the lumbar spine, which would otherwise occur, owing to the weight of the legs when flexed on the pelvis in being raised upward by the action of the *ilio-psoas*.
11. **On the Hands.**—In this position the skeleton is prevented from collapsing between the two fixed points (hands and feet) by the action of the *abdominal muscles*, the *ilio-psoas* and the *quadriceps-extensor*. The weight of the upper part of the body is carried on the arms by the action of the *serratus magnus* on the shoulder blades.
12. **Trunk bending forward.**—As the trunk moves forward the *erector spinæ* muscles maintain the position of the spine with reference to the pelvis, while the *hamstring* muscles regulate the forward inclination of the pelvis, and bring it back again to its original position. In the **Forward lying** position, and in the exercises taken from it, the same muscles are in action by the *gluteus maximus*.

68. TABLE OF PRINCIPAL MUSCLES OF THE BODY

Group.	Muscle.	Origin.	Insertion.	Action.
1. SPINAL MUSCLES. Act on the Head ...	Splenius Capitis.	7th Cervical, 1st-6th Dorsal Vertebrae.	Back of Skull.	Extends the head. Prevents the head falling forward. One side acting pulls the head to that side. Flexes the head on the neck, drawing in the chin.
	Complexus.	As above.	As above.	
	Rectus Capitis.	Upper Cervical Vertebrae in front.	Base of Skull in front of Spine.	
	Sterno-Mastoid.	Upper end of Sternum and Inner Clavicle.	Skull behind ear.	Both acting, pulls head and neck forward or raises chest and helps inspiration. Extends the neck.
	Splenius Coll.	Upper Dorsal Vertebrae (behind).	Upper Cervical Vertebrae (behind).	
	Longus Coll.	Front of last 3 Cervical and Upper Dorsals.	Upper Cervical Vertebrae (in front).	Flexes the neck.
	Scaleni.	Front of Lower Cervicals.	First or Second Rib.	Flexes the neck, or raises the ribs helping the respiration.
	Erector Spinae.	Pelvis and Sacrum and back of Lumbar and Dorsals.	Angles of Ribs and Upper Dorsal Vertebrae.	Extends the spine or lowers the ribs, helping expiration.
	Abdominals.	Upper border of Pelvis (in front).	Lower border of the Ribs and Sternum.	Pulls chest down, helping expiration. Flexes spine or raises pelvis.
	Psoas.	Lumbar Vertebrae (in front).	Femur—Lesser Trochanter.	Pulls spine forwards or raises legs.
2. SHOULDER MUSCLES. Act on Scapula. ...	Trapezius.	Back of Spine from Skull to last Dorsal.	Outer Clavicle, Acromion and spire of Scapula.	All fibres acting pull shoulder back. Upper fibres raise and lower shoulder.
	Serratus Magnus.	Upper 9 Ribs at side of Chest.	Inner border of Scapula.	
	Rhomboids.	Upper Dorsal Vertebrae.	Inner border of Scapula.	Pulls scapula forwards on chest wall. Punching or pushing muscle.
	Levator Scapulae.	Upper Cervical Vertebrae.	Inner top corner of Scapula.	Pulls scapula backwards towards spine and slightly upwards.
	Pectoralis Minor.	3rd, 4th and 5th Ribs in front of Chest.	Coracoid process of Scapula.	Raises the scapula. Pull scapula forwards and downwards.
	Deltoid.	Outer Clavicle, Acromion, and spire of scapula.	Outer shaft of Humerus, 1st of way down.	Abducts arm, anterior fibres raise arm forward, posteriors pull arm backward. Adducts arm.
	Pectoralis Major.	Inner Clavicle and 1st-6th Ribs.	Bicipital groove of Humerus.	
	Act on Humerus —			
	Abductors			
	Adductors			

Extends the elbow joint.

Ulna—Olecranon.

1. Scapula, below joint.
2 and 3. Back of shaft of Humerus.

1. Triceps. (Three heads.)

4. MUSCLES OF THE LEG.

Gluteus Maximus.

Hamstrings.

Biceps Femoris.

Rectus Femoris.

Gluteus Medius.

Gluteus Minimus.

Adductors.

Quadriceps Extensor.

Hamstrings.

Tibialis Anticus.

Calf Muscles.

Diaphragm.

Intercostals.

External.

Internal.

Abdominals.

Behind and below the head of the Femur.

Heads of the Tibia and Fibula below the knee.

Lesser Trochanter of Femur.

Knee cap or Patella.

Great Trochanter of Femur.

Whole length of posterior surface of Femur.

Patella and on to Head of Tibia.

Heads of the Tibia and Fibula below the knee.

Tarsus and 1st Metatarsal.

Through Tendo Achilles to Os Calcis.

To a flat Tendon lying in the centre of the muscle.

Upper border of the Rib below.

Upper border of Pelvis.

Extends the femur, sprinting, running and walking.

Extends the hip joint, sprinting, running and walking.

Flexes hip joint, kicking

Flexes hip joint, kicking. (Is part of the QUADRICEPS EXTENSOR.)

Abducts the thigh, *i.e.* raises it sideways.

Adducts the thigh.

Extends the knee joint as in kicking.

Flexes the knee joint, assisted by the calf muscles).

Flexes the foot.

Extends foot. Raising body on toes.

When relaxed is dome-shaped, when contracted it tends to flatten, thus enlarging the chest and drawing air into the lungs.

Externals = Inspiration. Internals = Expiration.

Raise ribs = Inspiration.

Lower ribs = Expiration.

Draws chest downward and drives diaphragm up by pressing on the contents of the abdomen. Expiration.

CHAPTER XII

METHOD OF USING AND COMPILING TABLES

69. GENERAL REMARKS

1. The tables issued in Table Card form in conjunction with this manual are examples of the way in which the system of physical training may be applied to various classes of men under instruction. They must not, however, be looked upon as the only means of applying the system.
2. It must be realized that each table of a series is part of a completely organized whole, and has reference to all the other tables of a series, whether they come before or after it. The exercises of one table prepare the way for and lead up to those of the following tables; the instructor should therefore study the whole series before commencing to instruct a class, and also during the course of the instruction, so that he may prepare the men as much as possible, while executing one table, for the exercises of the various groups in the next and following tables, by gradually improving the accuracy of performance of the different exercises, slightly increasing the number of times of execution or the difficulty of a particular class of exercise, etc., so that there may be steady progression in the fullest sense of the word from table to table.
3. The length of time for which each table should be used cannot be definitely laid down, as it depends on the capabilities and progress of the men. It rests with the instructor to go from one table to another when he considers that his class is ready for it, and each table should be gradually worked in by teaching three new exercises of a new table one day and one or two the next, and so on, until the whole table is known by the student. When the class is ready, proceed to the next table in the same way. The guiding principle in this respect should be that the men should be able to perform the exercises of one table, not necessarily perfectly, but as well as can be expected at that stage of their training before proceeding to the next. It is a question for the instructor's judgment.
4. If the progress is too slow, the men get bored and will not improve in proportion to the time spent on the work.
If the progress is too quick the men will not have time to derive full benefit from the exercises and will consequently not be

sufficiently prepared for the next table. The ill-effects of this are very hard indeed to rectify; and attempts made to rectify an error of too rapid progression by going back over the old ground are very disheartening to the men.

5. The tables are arranged so that the passage from one to the other is as gradual as possible, but the instructor must understand that it is his business to make the transition still more gradual whenever necessary by preparing for coming exercises, and his experience after instructing several classes should help him to realize exactly how to do this to the best advantage.

When an exercise appears several times in different tables without further progression being indicated, the instructor must obtain progression in it by requiring improvement in style of execution, by increasing in moderation the number of times it is performed, or, in the case of jumps, by increasing the height without loss of style, etc., as the case may be.

6. *Complementary* exercises are not included in the tables. Such exercises should, however, always be introduced by the instructor whenever necessary.
7. When it is stated in a table that certain exercises are to be "added later," it indicates that such exercises should not be taken when the table is first commenced, but should be added to that particular table, according to the progress of the class, before passing on to the next.

70. ALLOTMENT OF TIME IN THE DAILY LESSON

1. Each Recruit's Table is intended to represent approximately an hour's work. The exact amount of time devoted to each group of exercises, or part of the table, must, however, be left to the instructor, who should keep his eye on the clock to see how much time is at his disposal, so that he may apportion it accordingly.
2. The following may be taken as a rough guide for arranging the time in the daily lessons :—

Marching and Running, and Introductory.—About 10 minutes in the earlier stages of instruction to about 5 minutes later on.

The final.—2 or 3 minutes will, as a rule, suffice.

As regards the general and **agility part** of the table, it is very important that plenty of time should always be devoted to exercises that promote activity and control, particularly the **Agility exercises**. In the earlier stages, 15 minutes is, as a rule, enough time to spend on **Agility**, as the necessary activity and control cannot be acquired until the effects of the other

exercises begin to be felt. Later on, the time devoted to Agility exercises may be increased to as much as 25 to 30 minutes, and the balance of the time devoted to the other general exercises.

It must be remembered that the Agility part of the table is the part that is going to create that feeling of joy of achievement or the desire to achieve something that others can do, and if this part of the table is properly put to the student it will create that mental condition of self-effort which is essential to the full benefit of the general part of the table.

3. When taking new exercises, it is necessary to devote more time to them than is required for old exercises, and the time must therefore be adjusted accordingly.

71. DEVIATIONS FROM THE TABLE

The sequence of the exercises in the daily lesson, as given in the Tables, should, as a rule, be followed ; but this can only be managed when the apparatus and space available are sufficient for the classes under instruction, *i.e.* when about half to a third of the total number can use the apparatus at the same time.

It is of course very desirable that there should be a sufficiency of apparatus, in order to obtain the best results in the most satisfactory manner. It must not, however, be thought that good results cannot be obtained without a full supply of apparatus. Where there is good apparatus the instructor should see that all the apparatus available is used, and not allow half his class to stand idle with apparatus available.

Note.—The Introductory group of exercises are for raising the temperature of the body so that the muscles work better, and this temperature should never be lost during the hour's work by standing about waiting for apparatus.

If the gymnasium is deficient of apparatus, the instructor must modify the table so that the classes do not have long pauses waiting for apparatus, etc. ; but this should be managed as far as possible without departing too far from the normal sequence of the exercises.

72. COMPILING TABLES

1. The following instructions will be found useful to those who may require to compile tables to suit special cases.
2. Every table of a series must be drawn up with reference to all other tables of that series. The whole series should therefore be compiled together.

3. The principles of the arrangement of the daily lessons, and of the progression from week to week (Sec. 4), must be carefully observed.
4. In selecting exercises the definite physical result it is desired to obtain should be the guiding factor, but the following must also be taken into consideration :—
 - i. Apparatus and space available.
 - ii. Length of course.
 - iii. Age, ability and previous training of the pupils.
5. The following successive steps are then recommended for adoption :—
 - i. Rule a large sheet of paper in thirteen vertical columns, heading them from left to right :—
No. of Table, Marching and Running, Introductory, Heaving, Lateral, Balance, Abdominal, Dorsal, Jumping, and Vaulting, Horse Work, Ground Work, Final, Corrective.
 - ii. Consider the average standard of the pupils, and write down under the respective headings across the paper the exercises they are capable of performing. Place the figure 1 in the left hand column.
 - iii. Consider and decide in terms of exercises the standard the pupils should be expected to reach on the conclusion of the course, and write down these exercises under their respective headings across the bottom of the ruled sheets.
 - iv. Consider each group separately, and write down in each column the exercises in proper sequence from those in Table I to those at bottom of the sheet.
 - v. Taking the exercises in the Heaving, Balance, Abdominal, Horse and Ground Work groups, decide on the number of progressive steps required from Table I to Final Table. The number of these steps will give the approximate number of Tables necessary.
 - vi. Consider time available and finally decide number of tables.
 - vii. Rule out a similar sheet to that mentioned in subpara. i., above, and divide horizontally into the number of tables decided on, numbering these divisions from 1 upwards in the left hand column.
 - viii. Write in the exercises under the main groups, i.e. Heaving, Balance, Abdominal, Horse and Ground Work, progressively, and arrange the exercises in the remaining groups to correspond.
 - ix. It may be necessary to re-adjust the tables slightly as the work proceeds, and this can easily be done by slowing down or speeding up progression.

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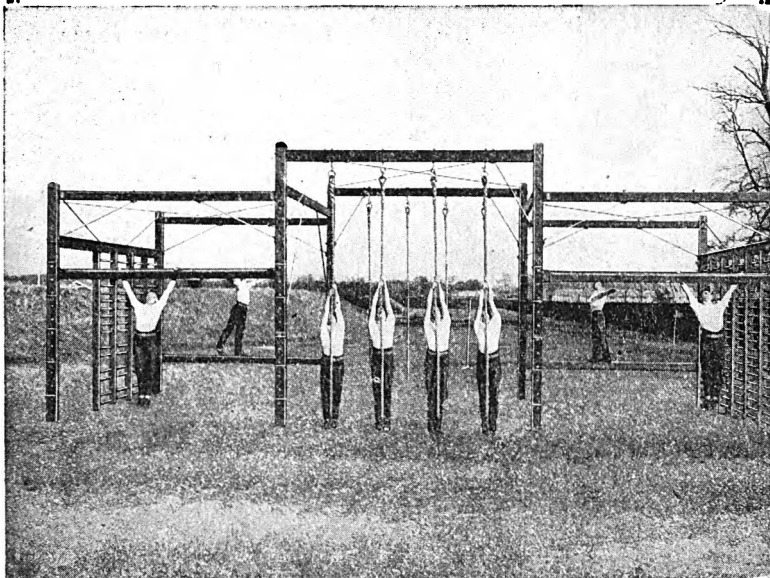
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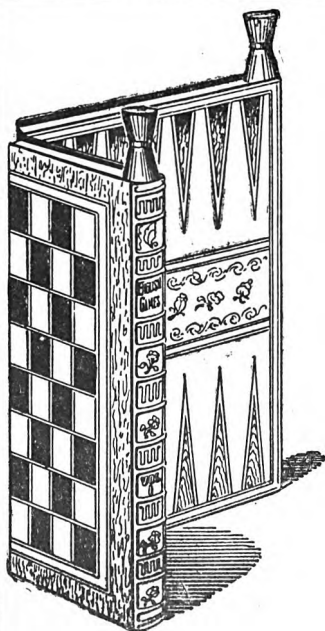
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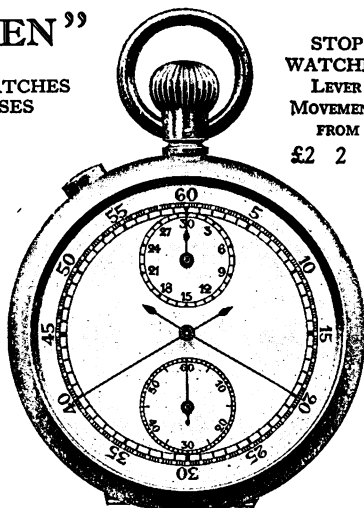
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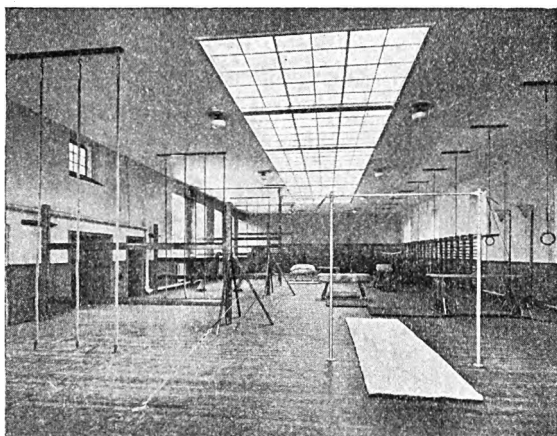
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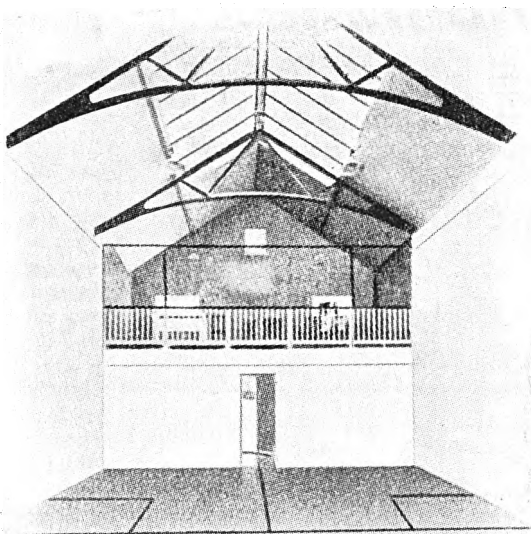


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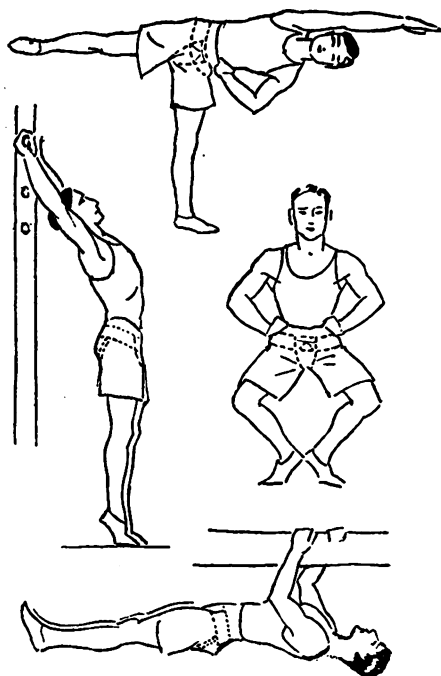
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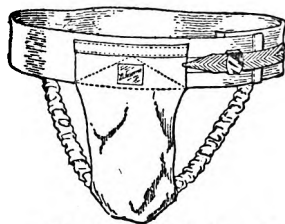
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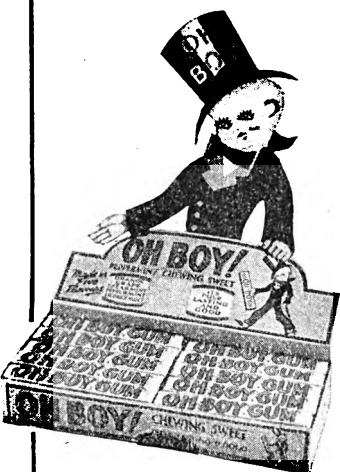
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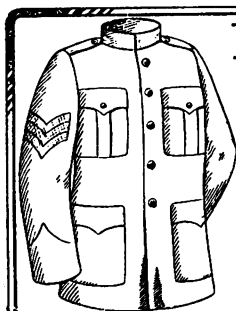
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